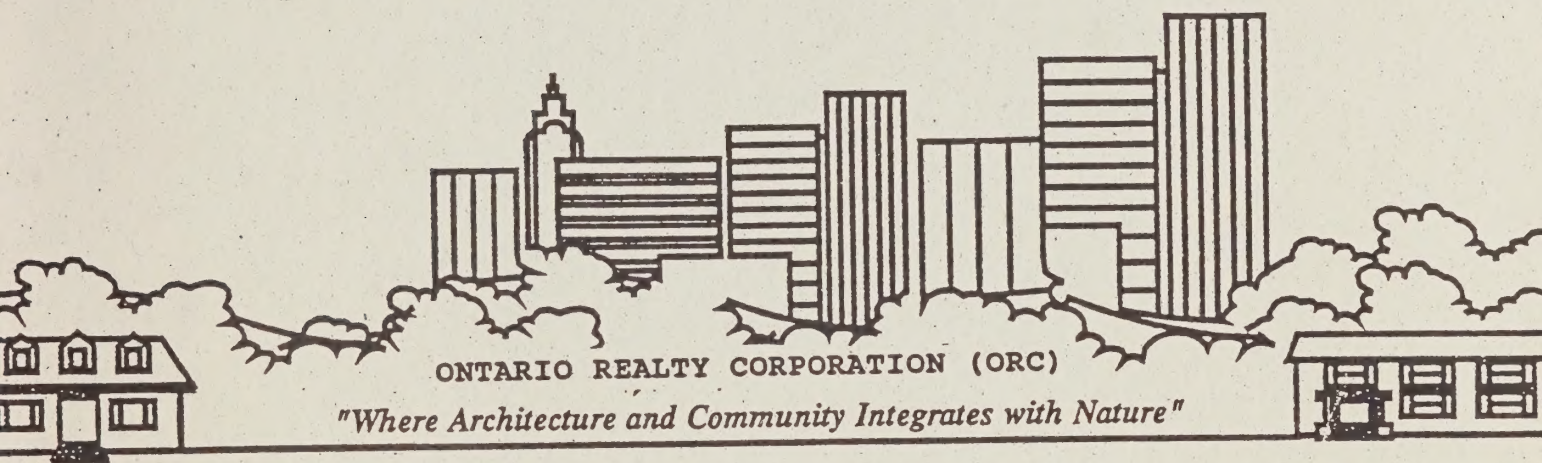


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CONTAMINANT RECOGNITION AND MANAGEMENT



Ontario Realty Corporation
OCTOBER 3, 1994



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October 3, 1994

TO: Ontario Realty Corporation Staff

This manual entitled "Contaminant Recognition and Management" was compiled by the undersigned, as an accompaniment to ORC staff training presentations and as a day-to-day reference.

When many common substances become loose in the environment, they become contaminants which are harmful to human health and the environment. There is, in Ontario, both a system of recognizing and managing contaminants and clear numeric standards which define what is clean. Based on this Ontario system, this manual outlines for ORC staff, the steps for recognizing and cleaning up contaminants and highlights the current Ontario standards.

It should **NOT** go without saying that *"an ounce of prevention is worth a pound of cure"*. Prevention and early avoidance of contaminants is, in part, the subject of a companion presentation and manual entitled "**ORC ENVIRONMENTAL ASSESSMENT**". Environmental Assessment is simply good planning and prevention.


Any comments regarding corrections or additions to this manual can be directed to the undersigned at phone # (416) 585-6755 or Fax # (416) 585-4263 (7577).

Any request for elaboration and for assistance with your particular contaminant management concerns can be directed to the undersigned or Ross Farewell, Environmental Planner at (416) 585-6741.



Wm. M. C. Wilson M.C.I.P.
Environmental Coordinator





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"CONTAMINANT RECOGNITION AND MANAGEMENT"(CRAM)

TYPICAL AGENDA

A ONE DAY IDEA EXCHANGE SESSION FOR ONTARIO REALTY CORPORATION STAFF

8:30-9:00 AM - Gathering

9:00-9:15 AM - Introductions, Objectives of Session, Main Message

9:15-9:45 AM SECTION 1 THE ISSUES

- What Are The Issues?
- Corporate and Individual Liability
- Specific Contaminant Issues

9:45-10:00 AM - Slides - The Problem - Experiences and Consequences

**10:00-10:30 AM SECTION 2 THE PROVINCIAL MINIMAL REGULATORY
CONTEXT**

- Environmental Protection Act
- Clean-up Guidelines
- Gasoline Handling Act & Energy Act + Fuel Oil Code
- Environmental Bill of Rights
- Class Environmental Assessment Process

10:30-10:45 AM - BREAK

10:45-11:15 AM SECTION 3 THE CLASS EA CHECKLIST

- Class EA 6-point Checklist
- What Triggers a Contaminant Environmental Site Assessment?
- The Phased Process for Environmental Site Assessment

11:15-11:30 AM - Slides - site observations
- Mississauga Transportation Place

**11:30-11:45 AM SECTION 4 CONTAMINANT CHARACTERISTICS IN THE
ENVIRONMENT**

- How Contaminants Present Liability-toxicity, mobility, migration
- Contaminant Sources, Pathways and Receptors
- Contaminant Numerical Criteria and Standards
- Spills

11:45-12:00 AM - Slides - Spills, Clean-up and Prevention

12:00-1:00 PM - LUNCH

1:00-1:15 PM **SECTION 5 ENVIRONMENTAL SITE ASSESSMENT**

- What is it? - Why assess?
- Escalating Levels - When is an ESA Required?
- The Four Phases

1:15-2:00 PM **SECTION 6 ADMINISTERING THE PHASE I ENVIRONMENTAL SITE ASSESSMENT PROCESS**

- Determine Need.
- Request For Proposal Format
- Suggested Phase I Scope of Services
- Candidate Consultant Selection
- Consultant Selection Criteria

2:00-2:15 PM - Phase I Slides - Surplus Refrigeration, 8060 Woodbine

2:15-2:45 PM **SECTION 7 PHASE I ENVIRONMENTAL SITE ASSESSMENT**

- Content, Results, Conclusions, Recommendations
- Demand Logic and Clarity in Consultant's Report!

2:45-3:00 PM - BREAK

3:00-3:15 - Slides - Sampling Technique

3:15-3:30 PM **SECTION 8 PHASE II ENVIRONMENTAL SITE ASSESSMENT**

- Sampling and Analysis Results
- Applying the Numerical Criteria to Results
- Chemical Exceedances of Criteria
- Clean-up Plan Prepared

3:30-4:00 PM - Phase II Slides - LUST site, Falstaff-Keele

4:00-4:15 PM **SECTION 9 PHASE III - CLEAN-UP**

- Waste Manifest
- Site Background (Ambient) Levels

4:15-4:30 PM **SECTION 10 PHASE IV - Clean-up Verification**

- Slides - Various "dig and dump" experiences

4:30-5:00 PM - Summary and Conclusions

- Process, Vigilance and Prevention
- Discussion

W. Wilson
October 3/94
CRAM-end

CONTAMINANT RECOGNITION AND MANAGEMENT (CRAM)

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OBJECTIVES OF SESSION

1. CONTAMINANT ISSUES
2. THE REGULATORY CONTEXT FOR CONTAMINANT MANAGEMENT IN ONTARIO
3. THE ORC USE OF CHECKLISTS TO INITIALLY DETECT CONTAMINANT PROBLEMS
4. CONTAMINANT CHARACTERISTICS IN THE ENVIRONMENT
5. THE PHASED PROCESS FOR ENVIRONMENTAL SITE ASSESSMENT
6. ADMINISTERING ENVIRONMENTAL SITE ASSESSMENTS (Contaminant Investigations)
7. PHASE I PROCESS AND PURPOSE
8. PHASE II, III AND IV PROCESS AND PURPOSE

MAIN MESSAGE:

There is, in Ontario, both a system to recognize and manage a wide range of contaminants and numeric standards defining what is clean; ORC controls contaminants and minimizes liabilities by using this system and set of standards.

CONTAMINANT ISSUES - AN OVERVIEW

ARE CONTAMINANTS REALLY THAT BAD? YES!

DO I REALLY NEED TO KNOW? YES!

IS IT REALLY PART OF MY JOB? YES!

WILL SOMEONE ELSE TAKE CARE OF IT FOR ME?

NO!

AM I QUALIFIED!! YES!

The Environmental Issues Involved With Property Management, Real Estate Transactions, And Capital Works Are Becoming More And More Part Of The Job.

In Particular ORC Staff Must Be Consistently Vigilant And Able To Identify When A Contaminant Issue Arises. With Identification, The Issue Can Then Be Managed Effectively And Safely.

BEYOND ASBESTOS.....

CONTAMINANT MEANS

Any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that may cause an adverse effect.

CONTAMINATION MEANS

The presence in soil, water, groundwater, air or structures of a material which may adversely affect human health or the natural environment.

(A situation in which waste or common substances such as fuel oils or asbestos become loose in the environment)

THE DEVELOPING ISSUE

- **TODAYS' INCREASINGLY STRINGENT STANDARDS BRAND PAST "WASTE" DISPOSAL PRACTICES AS ILLEGAL**
- **MORE SITES ARE BEING IDENTIFIED AS REQUIRING CLEAN-UP**
- **THE IMPACT ON THE NORMAL COURSE OF BUSINESS CAN BE PARALYSING**
- **LARGE, WELL-KNOWN SITES HAVE BEEN ADOPTED AS "ORPHANS" EG. - HAGERSVILLE**

MEDIA, PERCEPTION AND NEED FOR EFFECTIVE TECHNICAL COMMUNIATION

- **EXTENSIVE MEDIA ATTENTION**
 - Influences Public Opinion/Knowledge/Policy
- **PUBLIC CONCERNED AND CONFUSED**
 - Health And Public Safety Issues Are Not Well Understood But Of Prime Importance On Everyone's Agenda
- **PERCEPTION AND SCARE TACTICS PREDOMINANT WHERE INCOMPLETE INFORMATION APPLIES**
 - What You Hear About Is The Worst Case Scenario
- **ISSUES VERY TECHNICAL**
 - New Disciplines Needed For Real Estate Decisions: Chemical Engineers, Toxicologists, Hydrogeologists, Medical Officers of Health
 - Professionals need to effectively assess and communicate project specific issues.
- **At ORC Contaminant questions can be directed to Wm. Wilson, Environmental Coordinator
Phone: 585-6755**

Risks of pollution rank high in asset sales

BY DEIRDRE McMURDY
The Globe and Mail

Deals show that companies fear bills for cleaning up fouled environment

When Petro-Canada decided to sell some service stations to the employees who were operating them, the company also decided to rip out all the storage tanks at those sites.

The scorched earth policy is motivated by self-preservation — not malice, says Bill Hopper, chairman and chief executive of Petrocan. Down the road, if those tanks leaked into the ground or the water table, Petrocan would have to bear the cost of cleaning it up, he says.

"We're the ones with the deep pockets — not the independent operator. And whoever can pay in those cases is liable."

For the same reason, Imperial Oil Ltd. of Toronto has been thoroughly testing the service station sites it acquired with the assets of Texaco Canada Inc. that it must divest by order of Investment Canada. The issue of environmental liability is becoming an increasingly important part

of all corporate asset sales. In order to protect themselves against potentially huge cleanup bills, both vendors and buyers are scrambling to familiarize themselves with every aspect of the existing physical plant, its environmental record and the problems that could arise as environmental regulations and standards become more stringent.

A lack of legal precedents in the envi-

ronmental arena makes it even tougher for companies to protect themselves, despite the proliferation of lawyers specializing in the area.

In negotiating the terms of an asset deal, the ultimate price now frequently includes a discount or premium related to the environmental quality of an operation — not just the strength of its balance sheet.

"You can run but you can't hide — you can never completely sever your environmental liability as a corporation," says Gil

Environment affects deals

• From Page B1

Nebeker, environmental consultant with Purvin & Gertz Inc. in Houston.

Tom Irwin, vice-president of corporate development at Canadian Occidental Petroleum Ltd. of Calgary says even the most careful review of operations is fraught with risk because "there is a good chance that the rules will change in the future and you don't know how they will be changed and what will have to be cleaned up, altered or shut down."

Last week Bayer AG of West Germany agreed to acquire the synthetic rubber division of Nova Corp. of Calgary in a \$1.48-billion deal; a noteworthy part of that agreement was Bayer's undertaking to assume all past and future environmental liability associated with the division.

Gulf Canada Resources Ltd. of Calgary was less fortunate with the issue of environmental liability in its thwarted attempts to sell Asamera Minerals Inc.

Through its affiliation with a U.S.-based oil refining operation, Asamera is potentially liable to help pay for the cleanup of a former dumpsite in Colorado that the refinery used along with several other local industries.

It is that as-yet-undetermined financial responsibility which largely contributed to the decision by Corona Corp. of Toronto not to proceed with the acquisition of Asamera Minerals, despite the fact that Gulf says it has indemnified the subsidiary — and any future losses — against the liability.

Imperial Oil learned a similar lesson about the longevity of environmental liability after it donated the land of a former refinery site to the City of Calgary — a civic act for which it has subsequently been lambasted.

Some subsequent occupants of the reclaimed site, including greenhouse operator Philip Sprung, have charged that contamination of that land adversely affected their operations.

Major multinational corporations like Bayer maintain internal environmental teams that are called upon to assess every proposed acquisition. Bayer's environmental specialists were involved in the deal with Nova from the outset.

Most other companies, however, rely on a growing number of environmental consultants to assess possible purchases and sales.

Mr. Nebeker of Purvin &

Gertz, who specializes in the assessment of downstream oil refining and marketing operations, has developed a checklist to guide his review of an operation.

Early on in the process, he says, vital clues are provided by establishing when a facility was built, its history, the type of crude oil it processes, its disposal practices in the past, and its record as a corporate citizen based on correspondence and relations with state and federal environmental agencies.

Although most refinery and chemical complexes currently operating in North America were constructed in the 1940s and 1950s, several are decades older than that. According to Mr. Nebeker, the older the facility the greater the potential risk.

"In the 1920s no one cared if they dumped or what they dumped. The prevailing notion about disposal was to dump stuff into the ground," he says.

Another formerly common practice that has become anathema is the widespread use of asbestos insulation at industrial sites, which frequently requires replacement.

When examining land used by service stations, Jim Bishop, environmental consultant with Environment Protection Labs Inc. of Mississauga, tests for contamination of soil and water by an array of toxins associated with gasoline and lubricating oils, including lead from leaded gasoline and battery storage.

He says the cost of studying the potential environmental liability is negligible compared with the cost of addressing the problems identified or shutting a site down completely.

Where top soil is contaminated, for example, it is becoming increasingly difficult to find a landfill site willing to take it, Mr. Bishop says.

Even more complicated and expensive problems arise when a company opts to close an operation. In most cases guidelines dictating the standards to which the site must be restored are onerous; the Environmental Protection Agency in the United States enforces a 30-year monitoring program to ensure no future environmental problems are unresolved at the site.

Ultimately, Canadian Occidental's Mr. Irwin says, "the one way a corporation can protect itself is to sell its assets to a large financially responsible buyer. Someone who will be there to pay the price, if necessary, down the line."

G&M May 28/90

ENVIRONMENT — Page B6

INSIGHT BY GRAHAM SCOTT

Ontario's new cleanup law can hit even previous owners of property

On June 28, 1990, Superfund arrived in Ontario. The U.S. Superfund law has spawned massive liabilities for industry, and brought U.S. banks to the edge of a nervous breakdown. The concept slipped into Ontario in the guise of technical amendments to Ontario's existing environmental legislation. Bill 220, containing amendments to the Environmental Protection Act and Ontario Water Resources Act received royal assent only 15 days after being introduced.

The Hagersville, Ont. tire fire prompted the bill and the recent election caused the haste. The bill appeared to focus on a number of technical amendments addressing procedural problems that surfaced with Hagersville. The government also jacked up, for the third time in four years, the fines payable on pollution.

But nobody appears to have absorbed other provisions that create the potential for substantial cleanup liabilities for prior owners or occupants of real estate. Although the procedural changes and increased fines should not be discounted, it is the liability for cleanup costs that should concern both property owners and secured lenders in Ontario.

The Environment ministry usually deals with pollution through "control orders" and "stop orders." A control order can require the person responsible for a pollution source to install pollution-control equipment or take other steps to address emissions.

A stop order is more serious. It can be issued where there is immediate danger. Stop orders require the person responsible to stop whatever is generating pollution. To deal with waste, the ministry can issue a third kind of order (which we will call a "cleanup order") where waste has been dumped on property not approved as a "waste disposal site." The cleanup order requires that the waste be removed and the site restored.

Before Bill 220, the government could issue these orders only against persons who own, occupy or control the offending property at the time of the order. In other words, until June 28, the law made present owners or occupants, but not their predecessors, responsible for compliance and cleanup. Under the new bill, the government can issue the stop orders, control orders, and cleanup orders not only against the present owner or occupant, but against previous owners, previous occupants or persons previously having control of a property.

The results appear bizarre. A stop order generally requires a person to stop the activity that is causing pollution. How do you order a previous owner to stop pollution from a business he sold five years ago? How can a former tenant of a property be expected to comply with a control order if it requires pollution-abatement equipment to be installed in a building he can't even enter? During the 1982 recession, receivers in Ontario had control of a host of properties and businesses: How can you order a receiver in 1990 to clean up a plant site he sold in 1984 and is now owned and operated by someone completely new?

The answer to these riddles is found in the new procedural provisions letting the ministry undertake cleanups and other work at the expense of the owner or occupier. Bill 220 makes ministry orders enforceable as soon as they are issued. It lets the ministry take action instead of the owner or occupier where he refuses, or is "unlikely" to comply with the order, or where the ministry thinks it is in the "public interest."

The person to whom the order is directed must pay for the cleanup or other work. If the ministry undertakes the work, it issues an order requiring the person to pay; and this order is enforceable by the courts. The ministry can also direct the local municipality to add the costs to property taxes. So Bill 220 has put the environment at the top of the

GRAHAM SCOTT is a lawyer with McMillan Binch, Toronto.



Hagersville tire fire, with its toxic smoke and oil runoffs, spurred bill

creditors' ladder. It creates a lien for recovery of these costs, with priority over most other secured claims, including those of any registered mortgage holders.

Bill 220 means that not only the existing owner and tenant, but also every past owner and tenant of contaminated property in Ontario can be ordered to clean up the property or to fund the cleanup. This potential liability applies regardless of whether that person caused the contamination or was even an owner or occupant at the time the contamination occurred.

If there is a mortgage on the contaminated property, the mortgage lender can have the priority of his claim rank behind a bill for cleanup costs. Even more problematic, a lender now has to consider claims that may arise from properties that belonged to its own customer in the past but which have been sold. It is possible for a financial institution to review exposure of its borrowers on existing properties, but how do they assess liability for properties that have changed hands? How many properties did banks and other lenders control themselves by foreclosure or through receiverships after the 1982 recession? According to Bill 220, a person who owned or controlled land years ago still has potential responsibility for that property today.

In 1980, the U.S. passed laws to deal with mandatory cleanups of hazardous waste dumps. The legislation created a "Superfund" to finance cleanups of "orphan" sites, sites where the responsible parties could not be identified or no longer existed. The legislation now establishes a US\$8.5-billion fund with a separate US\$500 million specifically tagged to clean up leaking underground petroleum storage tanks.

Where the polluters can be found, Superfund placed responsibility for cleanup on several groups: current owners of the waste disposal site; previous owners at the time the hazardous substances were disposed of; waste transporters; and waste generators who used this site. The Superfund legislation strikes at a broad target — people who are considered to have caused the problem.

Because of Superfund's stringent liability provisions, some lawyers call it the most troublesome regulatory program facing industry today.

But in many ways, Ontario's Bill 220 goes further than the U.S. Superfund laws. It is not restricted to the persons who actually caused the problems. Any previous owner or occupier of polluted property may be a target, whether or not that person contrib-

uted to pollution. Peter Adams, standing in for the Ontario Environment minister, said the ministry would apply and enforce orders "against any prior owners of a property who may ultimately be accountable for an environmental hazard."

Time will tell how Bill 220 will be applied. But many fear that "accountability" is another way of saying "deep pockets." The first criterion is ability to pay, and active participation as a polluter straggles along behind.

The possibility of being hit with cleanup liabilities for properties previously owned and the expense involved should concern any business that owns or has owned significant real estate in the province. It should also concern bankers or other lenders. Larger pulp and paper, mining, steel, petroleum or chemical companies that have historically had large industrial sites may find themselves facing headaches because of their potential for attracting cleanup liabilities on properties they now own or properties they owned in the past. Owners of contaminated property may find themselves simply unable to borrow money at any price.

In October, 1989, Environment Canada floated a plan to contribute funding toward cleaning up abandoned waste sites.

The press release from the erstwhile Tory, Lucien Bouchard, indicated the federal government was prepared to put up \$150 million over five years to deal with "orphan" sites where the authors of the contamination could not be identified. An equivalent contribution was contemplated from the provinces. But the proposal was conditional on the provinces acting to clean up nonorphan sites — sites where the polluter could be identified. Bouchard called for immediate action from the provinces to deal with contaminated sites "where possible, at the expense of the responsible party, consistent with the 'polluter-pays' principal."

Bill 220 is Ontario's response to the federal proposal. Whether it will be used to "make the polluter pay" or is extended to predecessors who would not normally be held responsible, remains to be seen. The ministry has a wide discretion to recover costs from predecessors whether or not they contributed to the problem. The new NDP government's approach to the problem will be closely watched.

There is no doubt, however, that the previous Liberal government created potent new weapons to deal with the environment at the expense of property owners and their lenders.

Lenders leery of hazardous sites

Banks running tests on land before granting loans

BY MARINA STRAUSS
The Globe and Mail

Companies whose sites pose environmental risks are finding it more difficult to get credit from financial institutions because of their potential liability for cleanups under environmental laws, senior bankers say.

Banks, trust companies and insurance companies have started to tighten up criteria for making loans because of tougher laws that can make the lenders responsible if an environmental problem arises, said William Brock, executive vice-president of credit for the Toronto-Dominion Bank.

Lending institutions, including the TD, require — as a condition for a loan for an environmentally questionable property — a satisfactory test to show that it poses no hazards, he said.

Tighter criteria could mean the institution will lend a borrower less money than it would have in the past, he said, or ask for more secu-

rity for the loan.

The Royal Bank of Canada instituted an environmental lending liability policy last spring, which includes requiring the bank's account managers to investigate the environmental status of a property before granting a loan.

"Where the environmental risk appears excessive, the loan will be denied," David Dixon, the Royal's vice-president of asset management, told a conference recently.

Lawyers said the legislation can affect a wide range of companies, from a dry cleaner to a car manufacturer or a national resource processing company.

"It's potentially far reaching," Mr. Brock said.

He is also chairman of the Canadian Bankers Association's environmental risk task force, which is trying to draw up a policy to deal with environmental liabilities that may result from provincial legislation that has already been passed or is in the works.

Under Ontario legislation, for example, the government can have a "super priority" claim on a company's assets — over other creditors — if public officials have paid for a cleanup after the company failed to comply with an order to do so, Mr. Brock said.

"It means that this kind of legislation has to affect how we lend to companies who may have environmentally damaged property."

"If you're a company that's in a high environmental risk industry and you're operating from environmentally contaminated property and you want significant new credit, you may have increased difficulties in getting it because of the environmental legislation."

"It's going to become a problem in every province as they enact environmental legislation. . . . Every province is moving on this to some degree, in slightly different manners."

Please see LENDERS—B2

The problem has already raised its head in situations where companies with environmental risks have run into financial trouble. Lenders don't want to foreclose because they would then take on the financial burden for any cleanup that may be required — a cost that can be considerable.

"I know of situations where lenders have not foreclosed in order to avoid the risk of an environmental claim being placed on them to clean up the property," Mr. Brock said.

In some cases, according to a Toronto insolvency lawyer, secured creditors have simply abandoned contaminated property that had served as security for a bad loan, taking a loss instead, rather than risk being saddled with a hefty cleanup bill.

Even in provinces where the legislation isn't as tough as it is, Mr. Ontario, lenders are nervous about their past exposure to environmentally risky borrowers because many of the laws in effect are retroactive.

The Ontario law has increased the number of parties that can be held liable to clean up contaminated property. Anyone in possession or control of the property at any time can now be found responsible — rather than just those who created the mess.

One lawyer for the Ontario Ministry of the Environment said that when companies fail and a damaged site is left behind, "somebody has to pay for it. You want the taxpayers to pay for it? The cleanup can go in the billions [of dollars]."

When buying downtown property

"Not to carry out an environmental audit when you buy downtown property is like putting a gun to your head and wondering why it went off."

A blunt message from Toronto environmental lawyer, Roger Cotton, chairman of the Canadian Institute's forthcoming conference on environmental waste regulation.

Our cities are full of environmental time bombs, and they don't have to explode to claim victims. For example:

□ Unsuspecting buyers of contaminated downtown property may face millions of dollars in clean-up costs.

□ Past owners may be hit with lawsuits holding them responsible for contaminating the land — whether or not they did contaminate it.

□ Present owners of downtown property may start squirreling away assets to become bankruptcy-proof and abandoning their properties in downtown cities in order to avoid legal liability.

□ Governments may well abandon downtown urban renewal because they can't afford billions of dollars of clean-up costs.

□ City cores may become pockmarked with derelict buildings; urban renewal may become too costly, cities may rot.

"It's a massive problem," Cot-



Business and the Law
 Claire Bernstein

ton said. "We have spent the last 200 years contaminating our lands. We're going to spend the next 100 years to clean them up — if we can afford to do so — and it's highly questionable we can afford to do so."

Cotton says most of the prime downtown land in our cities is contaminated.

"Wherever there has been a history of industrial activity and anywhere there has been manufacturing, there have been spills. As people built things and made things, they spilled solvents, chemicals, gasoline.

"People used to spill their used oil and paint down the drain. These things were acceptable then. Today, contaminated land is a legal liability, the cost of clean-up running into the billions."

And even when a company attempts a clean-up, the standards for what is clean have not yet been established.

"There is a scientific debate going on how you clean up a site," Cotton said.

In the abandoned Ataraiti project, the Ontario government imposed an environmental-style "bone-marrow replacement" standard: Dig up the contaminated soil. Cart it away. Replace it by clean soil.

It was a billion-dollar clean-up instead of a few hundred thousand for paving over the soil. In order to carry out a super-clean soil clean-up, what's needed is a Super-duper Environmental Pooper-Scooper. But no person or government can afford one.

Business people who undertake compliance with environmental regulations and attempt a clean-up of contaminated property find themselves excavating a sinkhole that sucks in money like a giant Hoover.

"How much is clean? How much to take out? The government can't answer," Cotton said. "How can they then order something that is not definable?"

"We spend a lot of time with clients and consultants to create a new standard that government will accept. But even if they accept, the door is never closed to a higher standard."

"Even if you spend thousands, government can come back and say, we think you can to it cleaner. Do it again."

A prospective buyer of downtown land needs his head examined if the purchase is entered

into without a relatively inexpensive (about \$5,000) environmental audit.

The story Cotton tells of a Burlington, Ont., property purchase is one of many such disasters.

A company needed land for a warehouse. The price — \$1 million for 4 hectares (10 acres) of commercial land — was good.

The seller was seductive. "I want to make a quick deal. If we can close the deal quickly, I will give you a great price."

The purchaser agreed. But the speed of the deal left him no time to carry out an environmental audit.

After he bought the property, he discovered it was contaminated by chemicals. The clean-up costs were estimated at over \$10 million.

Some bargain. The seller is not going to pay the \$10 million — courts are reluctant to hold a seller responsible for "latent defects" when the purchaser is a "sophisticated" buyer who recklessly didn't carry out an environmental audit.

The Burlington example should put the fear of God into purchasers.

An audit is an environmental condom. Not to wear one is to risk environmental AIDS.

□ Claire Bernstein is a Montreal lawyer and syndicated columnist.

Ministry keeps wary eye on junk

Economics of garbage disposal encourage waste-stuffed warehouses

BY JOCK FERGUSON
The Globe and Mail

TORONTO — Two yellow disposal trucks backed into the side door of a North York warehouse and dumped their contents. A cascade of old dry-wall, concrete, metal, toilets, carpet and dirt spilled out, sending up a cloud of dust.

A large front-end loader pushed the waste into piles reaching to the ceiling of the 50,000-square-foot industrial building at 401 Clayson Road. Then a smaller machine compacted the piles.

It was a common scene at the gritty site, stuffed with tens of thousands of tonnes of waste since it was leased five months ago by Hercules Wood Recycling Ltd., owned by Joe Masara and his son, Carlo.

A 30,000-square-foot industrial building behind the Clayson Road site, also leased by Hercules, is jammed with construction waste too. Despite the name of the firm, there appears to be little wood among the waste.

Provincial Environment Ministry officials say the site is being operated without a waste transfer station permit, which is required wherever such debris is stockpiled.

They are monitoring the site closely for fear it may become another abandoned warehouse full of junk — a growing environmental and political problem in Metro Toronto.

They say Mr. Masara has told

them he sends as many as four tractor-trailer loads (40 to 80 tonnes) of trash daily to a dump in Erie, Pa. But they also say that is less than half the junk he takes in at discount rates from small disposal companies every day.

Bruce Cowie, the owner of the two buildings, said he was nervous at first about renting the building to Mr. Masara. "We knew there was a potential for disaster if he walked," Mr. Cowie said. "There was a little faith and desperation involved."

Hundreds of similar large industrial buildings in the area near Wilson Avenue and Highway 400 sit empty. "I'm not getting a great deal of money," Mr. Cowie added.

He said he thinks Mr. Masara "is trying to do it right. . . . We know a large number of loads have gone out, and we can see guys separating metal, wood and concrete." Joe Masara refused to discuss

what he would do with his huge stockpile. "Get the . . . out of here!" he yelled at a reporter.

A ministry spokesman said Mr. Masara applied for a waste transfer site permit in January, but none has been granted. The ministry is still seeking to determine whether the activity is appropriate for the buildings and whether Mr. Masara can come up with a bond to guarantee disposal of the material should his company go out of business.

The Masaras are also being investigated for stockpiling construction debris this past summer and fall at a site they operated at 11790 Keele Street in Vaughan. They had no ministry waste transfer permit for this site. They have since removed the stockpiled material and cleaned up the site, the owner said.

The economics of garbage has encouraged a number of people to stuff buildings full of trash in recent years

and then abandon them.

An Etobicoke landlord may have to pay as much as \$750,000 to clean up a building abandoned in February by a waste hauler who left about 40,000 tonnes of junk in the building.

Dealing with Hercules can mean substantial savings for small disposal companies. It currently costs about \$160 a tonne to dispose of construction and demolition waste at landfills in Toronto.

Hercules charges a flat fee — between \$600 and \$700 cash — for each load it accepts at the Clayson Road buildings. It has no scales, in the building and keeps few records of the waste material it accepts, ministry sources say.

Richard Strawn, an inspector with the Pennsylvania Department of Environmental Resources, said about 2,000 tonnes a week of construction waste is arriving at the Erie dump from Toronto and Hamilton.

BARTER / Credits for services rendered let people buy the things they need

Getting by on 'green bucks'

BY DAVID HILDERLEY
Special to The Globe and Mail
Toronto

AS the cash economy sputters, some people in the Metro area are bartering "green bucks" for food and

pain of the recession they are more receptive to a barter system. An attempt was made by the foundation in Willowdale in 1985 to launch a barter system but there wasn't the level of interest to get it started. But when the recession started to affect people

Similar barter programs operate in Samia and Kitchener. Each program offers advice and information to other communities wishing to install a LETS system.

There is no credit limit for green bucks account holders, no interest is

6xM, 93
May

NEW OWNER TO CLEAN UP VARNICOLOR SITE

FEBRUARY 2, 1993

The Ministry of Environment and Energy and the Philip Environmental Inc. have reached an agreement paving the way for the cleanup of Varnicolor Chemical Ltd.'s solvent recovery site at Elmira.

Philip has now purchased Varnicolor's recovery facility, the adjacent storage area and the property known as Lot 91. Under the agreement, Philip will assume all known cleanup costs. The ministry has indemnified the company

against unforeseen cleanup costs related to operations by the previous owners. Varnicolor remains responsible for these unforeseen costs, as well as past expenses incurred by the ministry at the sites.

Highly Charged

The recovery facility opened in 1964 but was shut down in 1990, when a ministry investigation led to 42 charges against Varnicolor and president Severin Argenton related to receipt of unauthorized wastes, discharging contaminants to the envi-

ronment and violating approval requirements.

Mr. Argenton was convicted July 9, 1992 of illegally storing solvents which have contaminated the company's main processing site and the adjacent property. He served three months of an eight-month jail sentence imposed last September.

Today, the main processing site is left with more than 5,000 barrels of waste material, as well as storage tanks containing chemicals and solvents.

Deadly Drum Roll

Ongoing ministry inspections at the solvent recovery site have uncov-



ered more than 600 leaking drums containing paint and liquid solvents, as well as hazardous and non-hazardous wastes. These drums have been placed in oversized containers to prevent further contamination of the environment; the ministry will attempt to recover the costs for this work from Mr. Argenton.

The chemicals contained in the leaking drums included vinyl chloride and 1,2,1,1-dichloroethane and trichloroethylene, which are suspected carcinogens. Chloroform is contained on the ministry's secondary list of hazardous chemicals which are candidates for banning or phaseout.

MINISTRY BACKS INNOVATIVE ENVIRONMENTAL PROJECTS

FEBRUARY 26, 1993

Tallon Metal Technologies Inc. in Wellington County has received \$126,465 for completion of Phase 2 of field-based pilot trials to remediate industrially contaminated soils. The funds come from the DESRT-Ontario Program, a joint funding venture through Environment Canada's Development and Demonstration of Site Remediation Technology Program and the ministry's Environmental Technologies Program (ETP).

The University of Waterloo also received \$62,538 under the ETP and administered by the Research and Technology Section to complete a project to prevent groundwater pollution through the use of sealable joint sheet pile cutoff walls. ETP assists organizations in the applied research, development and demonstration of new and innovative technologies that enhance environmental protection in Ontario.

For further information please contact Doug Vallery, Research and Technology Section (DESRT-Ontario and ETP), (416) 323-4476.

MORE FINES FOR POLLUTERS

Mines Must Pay For Dam Collapse

JANUARY 21, 1993

On October 17, 1990, the southwest wall of the tailings dam at the Old Matachewan Mine collapsed, discharging 130,000 cubic metres of mine tailings and water into Davidson Creek which flows into the Montreal River.

A Timmins court has fined Matachewan Consolidated Mines Ltd., one of its directors, Richard McCloskey, and Goldteck Mines a total of \$44,500 in connection with the mine tailings spill which contaminated residential water supplies at Elk Lake and Latchford.

Stinkers Stuck With Fine

FEBRUARY 24, 1993

A Scarborough court has fined Commander Business Furniture Ltd. \$20,000 and a director and executive, Raymond Harson, \$5,000 for discharging odour and gas into the environment.

Since March 1985, area residents had often complained that the odour was so strong that they had to remain indoors. Some residents said they experienced health ailments because of the problem.



Falconbridge Fined \$180,000 For Toxic Discharge

FEBRUARY 18, 1993

An Ontario court has fined Falconbridge Ltd. \$180,000 for discharging sulphur trioxide in the town of Nickel Centre during the summer of 1990. This fine is one of the largest fines imposed on

a mining company in Ontario's history.

From July 21 to 24, 1990, sulphur trioxide escaped from the Falconbridge plant in Nickel Centre. As much as 80 times the design specification was measured in gases leaving the acid plant. Corrosion and tubing failure caused the spill.

On at least one occasion, a sulphur trioxide cloud covered the town of Falconbridge where the smelter is located. The cloud of gas produced by the spill was so dense that one witness was not able to see the community of Falconbridge. Several residents experienced burning eyes, coughing, wheezing and nausea.

Man Fined \$75,000 For Illegal Dump

JANUARY 13, 1993

Pickering resident Norman Evers received a \$75,000 fine in one of the largest illegal waste disposal operations uncovered by MOE staff.

Truck loads of waste were dumped and covered with earth at a waste disposal site operated by Mr. Evers near Highway 7 in Pickering. Clean up costs at the site could reach \$750,000.

Fuel leak at TTC 'tip of iceberg'

46,000 litres lost at garage

BY JANE COUTTS
Urban Affairs Reporter

TORONTO — A storage tank at an east-end Toronto Transit Commission garage has leaked 46,000 litres of diesel fuel, highlighting a decades-old problem the TTC is spending millions of dollars to clean up.

The leak, which wasted about \$25,000 worth of fuel, is just "the tip of the iceberg" when it comes to environmental damage done by fuel on TTC properties, a source at the TTC said.

"Almost every garage is contaminated," said the source, who asked not to be named. "Over the years no one gave a damn. They just spilled it and let it drain away and never bothered to clean it up."

The leak in an underground fuel tank at the Lakeshore Garage on Commissioner's Street was discovered last Wednesday, and caused fuelling operations there to be shut down until they could be given "a clean bill of health," Judy Cohen, head of the TTC's environmental directorate, said yesterday.

Ms. Cohen said the diesel fuel escaped through a "pinhole" leak in a storage tank. Because the fuel is stored under pressure, it can escape quite quickly through a very small hole. Investigations have not yet established when the leakage began.

Both the fire department and officials from Ontario's Ministry of the Environment went to the scene when the leak was discovered, and meetings between the TTC and the ministry's fuel-safety branch are continuing.

"You're always concerned about fuel spills, but on this particular spill everything that should have happened, happened," said Al Leach, the chief general manager of the TTC.

He said the spill represents only a tiny portion of the TTC's annual \$23-million fuel bill, adding that the commission has at least one fuel spill of this magnitude every year.

But the source said every spill is written off as minor, and only when the damage over decades is taken into account does the real cost of running diesel buses begin to show.

"It's really ironic it happened the day before the TTC voted to shut down the trolley system," the source said. "The TTC would never say this is one of the reasons diesel buses are a problem, but they are spending millions to clean up old spills and they are still having them regularly; but they got rid of the [electric] trolleys anyway."

The worst contamination is at the garages at Yonge and Eglinton, the source said, but there are problems across Metro.

Ms. Cohen confirmed that the TTC is in the middle of a \$10-million program searching for and cleaning up contamination at all its properties.

Mr. Leach said the program was "paying for past sins," and added that TTC garages were no different from service stations in the old days, when used oil was just dumped on the ground to drain away. "Standards have changed."

But Metro Councillor Paul Christie, who sits on the transit commission, said it is unfortunate that such a spill could still happen at a time when the TTC is trying to clean up all its sites and has introduced a special positive-pressure system (similar to that used on airplanes) which make spills during actual fuelling impossible.

"This is something we have been trying to avoid while repairing 60 years of damage where people just said 'Whoops, fuel spilled' and didn't do anything about it," Mr. Christie said. "We are trying to clean up all our sites."

Globe & Mail
July 14/93

REPORT ON THE ENVIRONMENT

Tuesday, June 7, 1994

BY KIM LOCKHART
Special to The Globe and Mail

ANALYSIS / *The dawning realization in property circles is that great big chunks of liability are hiding below the surface of Canadian real estate*

The danger beneath

Who pays for the blunders?

Due diligence is the key to avoiding pollution land mines

Old ghosts may lie in the land you buy

Special to The Globe and Mail

THE best advice in any property transaction is to take a hard look around the site, Toronto lawyer Dianne Saxe says. When a large parcel of land is involved, aerial photography may be warranted. Otherwise, she says, "take a walk around the site to look for discoloured patches of lawn, or pipes sticking up that may lead to buried tanks. Don't accept easy explanations."

Better yet, the recommendation is to research thoroughly, back to the buffalo herds if possible, what prior uses have been made of a site. Unfor-

tunately, the title search that is standard to any real estate deal tends to turn up meaningless names and numbered companies that provide few insights.

One group that has a trove of information on private real estate is the Insurers Advisory Organization, which has offices across Canada. Tucked away in its master files, arranged by address, are duplicate copies of underwriting and property insurance reports that go back decades.

A year ago the group started the Historical Environmental Information Reporting System (HEIRS), which can supply a full history of a

property, complete with old schematics, in two days for about \$200. If nothing turns up on a site, the charge is waived. "We have our hits and misses, but our ratio in established commercial areas is very good," says Elizabeth Trolie of the IAO.

Parallel to this, lawyers suggest that a handy route to solid information about a property's history is to drop by the local municipal offices.

In their files or in their personal memories, municipal clerks have a way of knowing where the ghosts of those old gas stations lie.

CONTAMINANT COMPLIANCE MONITORING

MEANS

NEW ORC COST BUDGETTING

- **CURRENT ORC TENANT OPERATIONS MAY NOT BE IN COMPLIANCE**
- **BATTLE BETWEEN COST-AVOIDANCE AND COMPLIANCE IS CONSTANT**
 - **Minimum Standards Do Exist, And Need To Be Complied With**
 - **Clean-up And Compliance Costs Compete With Traditional Property Management Costs And Planning Budgets**
- **PRACTICAL, COST EFFECTIVE DECISION MAKING CAN ONLY BE MADE WITH ACCURATE, COMPLETE INFORMATION ABOUT CONTAMINANTS**

WHERE DO LIABILITIES LIE?

WHO?

- **LANDMARK COURT JUDGEMENTS NOW PUT TEETH INTO SECTION 194 E.P. ACT:**

"Every director or officer that engages in an activity that may result in discharge of a contaminant has a duty to prevent such unlawful discharge" Eg. BATA CORP.

- **AGENTS, BOTH BUYING AND SELLING NEED TO BE AWARE OF ANY ENVIRONMENTAL LIABILITY BEING TRANSFERRED.**

WHEN?

- **ON-GOING OPERATIONS**
 - **Buying**
 - **Selling**
 - **Changing Land Use**
 - **Construction**

THE NEEDS AT ORC ARE TO:

- COMBAT ASSET DETERIORATION

** especially with interim land management.*

- MINIMIZE LIABILITY

** Eg. necessity of "Environmental Warranties and Indemnities" (Certificate 2A) required by Ministry of Housing for sales to Non-Profit Housing Corporations.*

- LEARN COMPLIANCE REQUIREMENTS

** Common Law requires disclosure of presence of any wastes or contaminants in ORC Purchase and Sale form in Section on "Inspection and Condition".*

- BUDGET FOR COMPLIANCE COSTS

** Disclosure (or denial of wastes and/or contaminants) necessitates costs to investigate in order to exhibit due diligence.*

- SUPPLY HIGH QUALITY REAL ESTATE
FREE OF HEALTH AND SAFETY ISSUES

SOME SPECIFIC CONTAMINANTS

- * ASBESTOS
- * LEAD
- * PCBs
- * UFFI
- * OTHER HEAVY METALS
- * EMR ?
- * PETROLEUM
- * CFCs
- * INDOOR AIR QUALITY
- * RADON GAS
- * NOISE
- * OTHER

ASBESTOS

- **CONSIDERED AS A HEALTH HAZARD WITH THE ABILITY TO CAUSE LUNG CANCER**

- **Designated Substance In Ontario**

- **GENERALLY FOUND IN OLDER BUILDINGS ESPECIALLY BETWEEN 1955-1973**

- **Banned In 1973 As Sprayed Fireproofing**

- **VARIED USES REQUIRES ATTENTION DURING MAINTENANCE**

* **SPRAYED FIREPROOFING** * **ASBESTOS TILE**

* **ASBESTOS CEMENT** * **FRICTION MATERIALS**

* **TRANSIT PIPE** * **ASBESTOS PAPER**

* **TEXTILE PRODUCTS**

ASBESTOS

WHAT IS ASBESTOS?

Asbestos is the term that has been given to a group of naturally occurring mineral fibres containing magnesium and silicon. The name asbestos comes from the Greek word meaning indestructible. In more recent years, asbestos has also been termed incombustible. Asbestos is mined primarily from open pits in many countries with the most significant being Canada, the Soviet Union, the United States, China, South Africa and Australia. Canada is the world's second largest producer, and accounted for 35% of the world's production in 1970 when asbestos was used extensively in many products.

There are over thirty different varieties of asbestos in existence but only six are of commercial importance. The six are divided by morphological characteristics into two main groups of asbestos, the "serpentine" and the "amphiboles".

WHAT ARE THE HEALTH EFFECTS ASSOCIATED WITH EXPOSURE TO ASBESTOS?

The adverse health effects associated with asbestos exposure have been extensively explored for many years. The results of these studies have demonstrated that the inhalation of asbestos fibres may lead to an increased risk of developing one or more respiratory diseases. Despite extensive research, the cause for an increased susceptibility to such diseases is still unclear.

Asbestos fibres, because of their relative size, tend to settle out very slowly in air, allowing them to remain airborne for many hours and sometimes days. Asbestos fibres are easily picked up and carried by the slightest air currents. Once airborne, the strength of air currents and the size and shape and orientation of a given asbestos fibre determines how fast it will settle out.

The smaller the fibre the longer it takes for it to settle.

Inhalation of airborne asbestos fibres is the significant route of exposure for two reasons:

- **Asbestos fibres can easily become airborne, and remain airborne for many hours.**
- **All asbestos related diseases are caused by the entry of asbestos fibres into the respiratory tract.**

ASBESTOS RELATED DISEASES

A Greek geographer, Pliny the Elder, wrote in the first century A.D. of a sickness of lungs, found in slaves who wore asbestos cloth. Modern scientists however did not relate exposure to asbestos with lung disease, until the late 1890s. A post mortem, performed by Montague Murray in 1899, identified a fibrosis of the lung, caused by exposure to asbestos. This fibrosis was termed "asbestosis" in the 1920s. It wasn't until the 1940s that the development of lung cancer was associated with asbestosis and exposure to asbestos fibres. And in the 1950s it was determined that mesothelioma, or cancer of the lining of the lung or abdomen, was also caused by exposure to asbestos fibres.

CONTAMINANT ISSUES

ASBESTOS

- **MAINTENANCE AND MANAGEMENT INCLUDING REMOVAL OF ASBESTOS IN BUILDINGS IS HIGHLY REGULATED BY REGULATION 654/85 OF OCCUPATIONAL HEALTH AND SAFETY ACT**
- **DISPOSAL OF ASBESTOS REGULATED BY REGULATION 347 OF ENVIRONMENTAL PROTECTION ACT**
- **ADDS SIGNIFICANTLY TO COSTS OF DEMOLITIONS AND ALTERATIONS**
- **SALE OF ASBESTOS-CONTAINING BUILDINGS SHOULD DISCLOSE THE EXTENT AND TYPE OF ASBESTOS**

CONTAMINANT ISSUES

PETROLEUM PRODUCTS

- **PETROLEUM PRODUCTS MOST COMMON CONTAMINANT ENTERING THE ENVIRONMENT**
 - * **GASOLINE**
 - * **FUEL OIL**
 - * **DIESEL**
 - * **VAR SOL**
 - * **THINNERS AND SOLVENTS**
 - * **CREOSOTE**
- **COMPONENTS OF GASOLINE (BENZENE) ASSOCIATED WITH HEALTH EFFECTS INCLUDING CANCER**
- **PETROLEUM CONTAMINATION SITUATIONS PRESENT HIGHEST PRIORITY ENVIRONMENTAL CLEAN-UP SITUATIONS ON LAND**

CONTAMINANT ISSUES

LEAD

- **LEAD ASSOCIATED WITH HEALTH EFFECTS**
- **LEAD ASSOCIATED WITH MANY PRODUCTS AND ACTIVITIES**
 - * **SOLDERING/WELDING**
 - * **LEADED GASOLINE**
(banned in Canada, Dec. 1, 1990)
 - * **BUILDING MATERIALS**
 - * **PAINTS**
- **POTENTIAL IMPACTS FROM NEIGHBOURING INDUSTRIES INCLUDE LEAD DUST AND FUMES**
- **COMMONLY ENCOUNTERED DURING SITE REDEVELOPMENT DUE TO PAST USE**
- **ACCEPTABLE LEVELS OF LEAD ARE BEING REDUCED FROM CURRENT STANDARDS**

HISTORY OF LEAD TOXICITY

Lead has been known to be a poison since antiquity; some suggest it was a contributing cause to the fall of the Roman empire.

Exposures increased substantially during industrialization due to the widespread dispersal of lead. Bone comparisons show pre-historic man had much lower exposures.

In modern times the dangers of lead were seen first in the occupational setting (miners, smelters, printers). The Massachusetts Bay Colony (1723) banned the use of lead in making rum because of complaints of "dry colic" from customers. Benjamin Franklin authored a famous letter in 1783 describing lead poisoning in printers. Historically, we often discover adverse health effects from hazardous agents in occupations where exposures are usually highest.

In 1870, Bismark banned the manufacture of lead pigments in Germany. Australia reported the first case of poisoning from lead paint in 1890, but many physicians remained sceptical. In the 1920s articles on "paint eaters" children, appeared in magazines. Although some children were likely poisoned by eating lead-based paint (LBP) chips, today we know that lead dust is the primary hazard.

The mining, refining and export of lead is a major Canadian industry. Nearly two million tons of lead are produced each year in this country, much of it exported. The fate of this lead has been unknown in detail but just under half of it is used to make electric storage batteries. Additional uses for lead are in the construction industry, in paints, lead shot and tetraethyl lead in gasoline for export.

A Canadian adult ingests about 160 millionths of a gram (microgram) of lead each day in food and water, most of it being lead which was naturally present in the rocks and soil. Of this only about one-tenth is "digested" and enters the blood. From the air in Canadian cities, an adult in the 1970s inhaled about 15 micrograms of lead each day, of which about five micrograms (depending on the size of particles) was retained in the lungs to be eventually absorbed into the blood. Most of this lead came from automobile exhaust. Exposure has been reduced significantly with the introduction of lead-free gasolines. This normal daily uptake of lead by the body presents no known hazard to health; a small proportion of it is deposited in the bones, where it is stored for years, and the rest is excreted over a shorter period.

However, if the average daily uptake of lead by the body increased, there would come a point when the body lead content could reach harmful levels. The excess accumulated lead would give toxic symptoms in the course of a lifetime. Although the precise uptake of lead at which this process would begin is not known, it is not thought to be less than 60 micrograms per day per adult, compared with the average of 21 micrograms per day present in the 1970s.

LEAD AND ITS USE IN PAINT

Lead is a soft, malleable, heavy, grey metal. Its chemical symbol is "Pb" from the word "plumbum". Plumbism applies to lead poisoning; a plumber works with lead; plumbago is graphite in pencils (or a mineral deposit) which looks like lead. Powdered lead metal and lead alloys were used in paint for chemical and anti-corrosive effects.

- Abbreviations
 - PbB (Blood Lead Level)
 - LBP (Lead-based Paint)
 - EBL (Elevated Blood Lead)
- Common units of lead measure:
 - a. gram (mass or weight), milligram, microgram
 - b. weight percent
 - c. surface area concentration
 - mg/cm² (XRF)
 - µg/ft² (wide sampling surface dust)
 - d. airborne concentration (µg/m³ or mg/m³)
 - e. blood concentration (µg/dl or µmole/L)

There was a decline in the use of white lead pigments in the 1950s as titanium oxide and lithopone came into use. Lithopone production doubled from 1951 to 1953, while white lead pigments declined by an equal amount. Lithopone and titanium oxide are cheaper and have better hiding power than lead pigments.

Paints are typically composed of binders, extenders (fillers), thinners (solvents), and driers. So-called "lead-free" paint often contains a small percentage of lead as a drying agent or extender. Also, asbestos is used as an extender for old paint. Lead acetate used as an extender (0.5-1%) in varnishes could increase the surface coverage by as much as 30%. The varnish remains translucent and may resemble wood.

SOURCES OF LEAD EXPOSURE

Paint, gasoline, stationary sources (battery plants, smelters, food (canning, contamination), water (lead pipes and solder). The use of lead in cosmetics also may be a consideration for certain ethnic groups.

- Intact lead paint presents a potential hazard, although it may not necessarily be a current hazard.
- Lead dust levels are a better measure of the current hazard.

ROUTES OF ENTRY

a. Ingestion

Ingestion is the most important route of entry of lead into children via ordinary repetitive hand-to-mouth activity. Lead in water is more easily absorbed into the blood stream because it is already in solution and more bio-available.

Ingestion is also an important route of exposure for adult workers through eating, smoking and drinking in lead contaminated work areas. For this reason personal hygiene practices are required on all lead-abatement projects.

b. Inhalation

Inhalation is an important route of entry for unprotected adult workers who may be working in lead contaminated work areas.

Regardless of the source, fetuses in the womb can be exposed to lead from maternal body stores of lead which readily cross the placenta from mother to fetus throughout pregnancy, including critical periods when the nervous system is being formed. After birth, lead can also be transferred to the child from mother's milk.

Skin absorption is a minor route of lead intake. Humans absorb very little inorganic lead through the skin.

MAJOR HEALTH EFFECTS OF LEAD POISONING

These include:

- reduced IQs, delayed cognitive development, and other learning disabilities (many likely to be irreversible)
- central and peripheral nervous system damage
- liver and kidney problems
- GI track involvement

SCOPE OF THE PROBLEM

Exposure to lead-based paint (LBP) and dust associated with the deterioration of LBP is one of the major threats to public health today. Children are at greater risk; irreversible mental retardation, learning disabilities, and many other health effects are possible.

Adults are also at risk. Since the fetus is especially at risk, women of child-bearing age must be accorded special consideration.

While some children continue to get lead poisoning from eating paint chips, we now know that the most important route of exposure is ingestion of lead dust by hand-to-mouth contact. Controlling lead dust is a critical issue in lead paint abatement jobs. Exterior soil contamination from exterior lead paint and leaded gasoline fallout is also a major concern.

In adults, both inhalation and ingestion of lead dust are important routes of exposure. There are still many cases of adult lead poisoning, especially in construction. LBP abatement is a type of construction activity.

Peeling paint results in exposure to lead. As exterior paint ages, it chalks so that it maintains a "fresh" appearance. Chalking and peeling paint chips eventually form lead dust, which can be ingested and absorbed.

Windows are known to be particularly significant sources of lead dust, both from abrasion of leaded paint and from atmospheric particulate deposition.

Abrasion from a sliding window sash painted with leaded paint creates lead dust.

LBP was considered for many years to be the very best paint money could buy. Lead compounds were attractive as key components in durable finishes because they had good hiding power and were chemically inert.

These paints are still used today in industrial, commercial and marine applications. Yellow highway paint usually contains lead chromate. Steel structures, such as exterior of water tanks, are painted with LBP.

Lead poisoning is estimated to be among the top ten (10) notifiable diseases in the US and Canada. The magnitude of the problem serves as the rationale for legislative and regulatory action to control lead poisoning. It is estimated that many cases are unreported due to the difficulty in diagnosing lead poisoning.

Many types of mistakes can be made during the testing phase. Detecting LBP is often difficult because it is usually the first layer applied and can be hidden beneath many other layers of non-lead paint.

CONTAMINANT ISSUES

CHLOROFLUOROCARBONS (CFC)

- **CFC's SEEN AS SUBSTANCE THAT ATTACKS THE OZONE LAYER**
 - **Ozone (O₃) Protects The Skin From UV Rays**
- **CONTROL OF CFCs INITIATED BY CANADA (The Montreal Protocol) BUT NOW INCLUDES 97 COUNTRIES**
- **LARGEST IMPACT ON MBS WILL BE IN AIR CONDITIONING SYSTEMS**
 - **Certification of Persons Handling CFC's NoW Regulated**
 - **MBS Suppliers of CFC Handling Services Must Show Evidence of Training And Certification**
 - **Driving New Technology Options**
- **SUBSTITUTE REFRIGERANTS**
 - **Very Few Available**

ATTENTION: REFRIGERATION TECHNICIANS

If you work with refrigerants
you need this card.

The Ontario Ministry of Environment and Energy has introduced a regulation to prevent the release of fluorocarbons into the atmosphere. Fluorocarbons are widely used as refrigerants and, when released into the atmosphere, are one of the major causes of the depletion, or thinning, of the earth's protective ozone layer.

FOR YOU, THE MOST IMPORTANT ASPECTS OF THE REGULATION ARE:

Effective immediately, venting, or releasing fluorocarbons into the atmosphere is prohibited.

Effective October 1, 1994 you must have an Ozone Depletion Prevention Card (ODP) to be able to service and repair refrigeration equipment* and to purchase and handle refrigerants. Without your ODP card you will not be able to carry out any of these activities.

*Includes all stationary and mobile air conditioning systems (including those in passenger vehicles), refrigerators, freezers, heat pumps—domestic, commercial, industrial.

OZONE DEPLETION PREVENTION CARD

0123 456 789 12345

J. DOE

EXPIRY: DECEMBER 31, 1997

 Ontario

THIS CARD DOES NOT CERTIFY THE INDIVIDUAL TO BE IN COMPLIANCE WITH TRADE QUALIFICATION REQUIREMENTS OF ONTARIO.

JOHN SMITH, DIRECTOR
MINISTRY OF ENVIRONMENT
AND ENERGY

HERE'S HOW TO GET YOUR OZONE DEPLETION PREVENTION CARD:

You must complete a training course and examination on the proper procedure for handling fluorocarbon refrigerants approved by the Ministry of Environment and Energy.

TO REGISTER FOR A MINISTRY-APPROVED COURSE CALL:

The Heating Refrigeration and Air Conditioning Institute of Canada at 1-800-661-3369 or 905-602-4700 in Toronto. Members of Local 787, Refrigeration Workers Union may register by calling 1-800-387-9121 or 905-790-1021 in Toronto.

 Ontario

CONTAMINANT ISSUES

POLYCHLORINATED BIPHENYLS (PCBs)

- **A SUSPECTED CARCINOGENIC AGENT**
- **HEAVILY REGULATED WITH RESPECT TO:**
 - * **Transportation - Municipal Borders Shutting Down to P.C.B.s**
 - * **Storage**
 - * **Disposal**
 - **Liquids Under 10,000ppm Can Be Destroyed By Mobile Sodium Process**
 - **Less Than 50ppm Of PCB Is Considered Not A Contaminant**
 - **Decontamination Option Not Available For Liquids Over 10,000ppm Or Contaminated Soils**
- **PCBs Found In Transformers, Capacitors, And Light Ballasts**
- **PCBs Prohibited Since 1980 In New Products**
- **Impact On MBS Related To Storage Responsibilities**
- **Future Saleability Of Old Ballasts, Especially With PCB's, Is Questionable**
- **MBS Has Treated Equipment Using "Westinghouse Process". Reference Manno Kottis, Kemptville, MBS PH. 613-258-8260**

POLYCHLORINATED BIPHENYLS (PCBS)

Polychlorinated Biphenyls (PCBs) belong to a family of organic chemicals known as chlorinated hydrocarbons. They are synthetically produced by attaching up to 10 chlorine atoms to a biphenyl molecule.

PCBs vary from colourless, oily liquids for the lower chlorinated compounds, to more viscous and increasingly darker liquids, to yellow and then black resins for the most highly chlorinated types. They are heavier than water and somewhat slippery. The vapour is invisible and has a bitter smell.

The most common route of PCB entry into humans is through the ingestion of contaminated food, such as fish, however PCBs may also be inhaled and absorbed through the skin.

HEALTH EFFECTS ASSOCIATED WITH EXPOSURE TO PCBs

The effects of ingestion by human beings were observed following a number of industrial accidents. The worst occurred in Japan in 1968 when rice oil was contaminated by PCBs. The "Yusho" incident affected more than 1500 people. With a total intake of 0.5 to 2 grams, the symptoms include chloracne (severe skin eruptions) increased eye discharge, systemic gastrointestinal symptoms with jaundice, edema and abdominal pain. Chloracne is very persistent and some patients showed evidence of it after three years.

Laboratory studies indicate that PCBs can cause cancer in animals, depending on the degree of exposure. The available data are not adequate to confirm or negate similar effects in humans at this time. Until further research is completed, PCBs remain a suspected carcinogenic agent in humans.

INDOOR AIR QUALITY

- MORE AND MORE AWARENESS BY TENANTS OF "SICK BUILDING SYNDROME"
- PROPERTY MANAGERS MUST RESPOND TO TENANT COMPLAINTS IN A PROFESSIONAL MANNER

UREA FORMALDEHYDE FOAM INSULATION (UFFI)

- FORMALDEHYDE HAS BEEN LINKED TO LUNG CANCER
- UFFI INSTALLED IN 70's AND 80's UNTIL BANNED
- MAIN IMPACT IS WITH DISCLOSURE ON PROPERTY TRANSACTIONS
(i.e. in "Inspection and Condition" Section of Purchase and Sale Agreement.)
- ONTARIO REAL ESTATE ASSOCIATION AGREEMENT OF PURCHASE AND SALE STATES:
"The Vendor represents and warrants to the Purchaser that during the time the Vendor has owned the property, the Vendor has not caused any building on the property to be insulated with insulation containing ureaformaldehyde, and that to the best of the Vendor's knowledge no building on the property contains insulation that contains ureaformaldehyde."

UREA FORMALDEHYDE FOAM INSULATION UFFI

Urea formaldehyde foams were developed in 1933 and by the early 1960s were widely used as a building insulation material throughout the world.

In late 1977, under pressure from urea formaldehyde foam producers, the Canadian General Standards Board (CGSB) developed provisional standards for urea formaldehyde foam insulation (UFFI). With this standard (51-GP-22M) in place, the Canada Mortgage and Housing Corporation, (CMHC), then accepted UFFI subject to several conditions, thus UFFI qualified as a product in the governments insulation grant programme (CHIP).

Under the CHIP programme approximately 25,000 Canadians with older homes were offered up to \$500 in subsidies to install the foam as an energy conservation measure. Other individuals with newer homes also insulated with UFFI to increase home heating efficiency. In total, over 80,000 homes in Canada were insulated with UFFI.

It subsequently became apparent that there was a potential for health problems from exposure to formaldehyde gas being released from UFFI. An expert Advisory Committee established by the Ministry of Health and Welfare Canada recommended a temporary ban on UFFI. On 17 December 198p, the government acted on these recommendations under authority of the Hazardous Products Act.

On 27 April 1981, the Federal Government of Canada passed legislation allowing homeowners to claim up to \$5,000 in compensation for remedial measures taken to solve UFFI related health problems. In addition, free home testing and advice was provided.

Formaldehyde is also found in the environment in photochemical smog, tobacco smoke, incinerator effluents and in automobile and diesel exhaust. It is produced during the process of normal metabolism but not as free formaldehyde.

UFFI releases formaldehyde vapour under several conditions. During the curing process there is an expected normal release of varying intensity which, if the foam is installed properly, usually subsides when the foam solidifies. The foam then continues to release gas at low levels forever. Occasionally there may be surges of vapour release, triggered by high temperature and/or humidity and break-up of the foam.

Individuals vary greatly to their physiological response to formaldehyde gas. Some persons experience immediate and conspicuous reactions while other make physiological accommodations and appear to have no reaction.

The exposure to formaldehyde is cumulative. Some individuals who have no reaction to their initial exposure, experience adverse health related symptoms during subsequent exposures. Others who are mildly affected during their first exposure become increasingly sensitized, and able to tolerate increasingly lower levels of exposure. Infants, the elderly and pregnant women, and hyper-allergic individuals are apt to experience the greatest discomfort.

The three main toxic effects of formaldehyde are its ability or suspected ability to cause

(a) irritation (b) sensitization and (c) cancer

RADON GAS

- NATURALLY OCCURRING RADIOACTIVE GAS THAT HAS BEEN LINKED TO LUNG CANCER
- MINISTRY OF NORTHERN DEVELOPMENT AND MINES PERSONNEL HAVE SOME DATA ON OCCURRENCE

METHANE GAS

- CAN ACCUMULATE IN POORLY VENTILATED STRUCTURES POSING A FIRE OR EXPLOSION RISK
- CAUSED BY BURIED ORGANICS (eg. WOOD WASTE) or NATURALLY OCCURRING PEAT DEPOSITS

MERCURY

- OVEREXPOSURE AFFECTS THE NERVOUS SYSTEM
- MERCURY IN PAINTS, OUTDOOR LIGHTING AND ELECTRICAL SWITCHES

RADON GAS

Radon, a natural radiation, is a tasteless, odourless, invisible gas seven and a half times heavier than air. Radon can be found seeping out of the earth all over the world, however, the levels will vary markedly with the amount of radioactivity in the ground.

Building materials also can give off radon. Common building materials such as wood bricks and concrete normally give off relatively little radon while granite and pumice on the other hand are much more radioactive. Calcium silicate slag - a highly radioactive by-product of the processing of phosphate ore - has been used to make concrete and other building materials in Canada.

Phosphogypsum, another by-product of phosphate ore production has been used in place of natural gypsum to make building blocks, plasterboard, partition systems and cement. While it costs less than natural gypsum, it is also many times more radioactive. People who live in houses containing it can expect to be exposed to about 30 percent more radiation than those who do not.

Other highly radioactive waste products used in buildings include red mud bricks from aluminum production, blast furnace slag from iron works, and fly ash from the burning of coal. In Port Hope, contamination waste material from Eldorado Nuclear was used for construction. Low level radioactive waste rock was used in Elliot Lake as a construction material.

Despite the concern about building materials, the ground underneath houses is almost always a greater source of radon.

The following factors contribute to the amount of radon gas present in a building:

- the radioactivity of the ground
- the radioactivity of the building materials
- the thickness of and integrity of the floorings
- the air tightness of the building
- the number of stories in a building (radon concentrations in upper storeys of high buildings tend to be lower than at the ground floor).

The United Nations Scientific Committee on the effects of Atomic Radiation (UNSCEAR) estimates that, together with its "daughters" (radionuclides formed as it decays), radon normally contributes about three-quarters of the annual effective dose equivalents received by individual people from terrestrial sources - and about half their doses from all natural sources put together. Most of the dose results from breathing in the radionuclides, particularly indoors.

Radiation does kill. It causes sever tissue damage at high doses. At low levels it can cause concerns and induce genetic defects that can affect the children, grandchildren and later descendants of those irradiated.

MERCURY

Mercury (Hg) is an element whose complex biogeochemistry enables it to exist in a variety of physical and chemical states (i.e. solid, solute, vapour and adsorbed vapour). It may be present as inorganic mercury or the far more toxic organomercurials such as methylmercury (CH_3Hg).

The toxicity of mercury depends on its chemical form. Its main route to entry into the body is through ingestion in foods. Other routes include breathing in air containing mercury vapour and/or mercury compounds and possibly through skin absorption.

The major toxic effects of exposure to mercury are manifested as abnormalities in the function of the central nervous system.

The greatest single use of mercury in Canada has been in manufacturing plants using the mercury cell electrolytic process to form chlorine and sodium hydroxide. The second largest single use is by the paint industry in the form of compounds added as preservatives and/or pigments.

**"TODAY YOU CAN MURDER LAND
FOR PRIVATE PROFIT. YOU CAN
LEAVE THE CORPSE FOR ALL TO
SEE AND NOBODY CALLS THE
COPS."**

by PAUL BROOKS IN THE PURSUIT OF WILDERNESS, 1971

THE MINIMUM PROVINCIAL REGULATORY CONTEXT

- **COMMON LAW**
- **THE ENVIRONMENTAL PROTECTION ACT (EPA)**
- **GUIDELINES FOR THE CLEAN-UP OF CONTAMINATED SITES IN ONTARIO**
- **ONTARIO WATER RESOURCES ACT (OWRA)**
- **GASOLINE HANDLING ACT AND CODE**
- **ENERGY ACT AND FUEL OIL CODE**
- **OCCUPATION HEALTH AND SAFETY ACT**
- **THE ENVIRONMENTAL BILL OF RIGHTS**
- **THE ENVIRONMENTAL ASSESSMENT ACT**
- **PROVINCIAL WATER QUALITY/DRINKING WATER OBJECTIVES**
- **PESTICIDES ACT**
- **EXCESS SOIL AND MATERIALS HANDLING POLICY**
- **PLANNING ACT**

COMMON LAW

- OBLIGES ALL TO DISCLOSE ANY KNOWN WASTES AND/OR CONTAMINANTS
- PRECEDENT EXAMPLE WAS A MALVERN (SCARBOROUGH) CASE OF RADIOACTIVE SOIL IN EARLY 1980'S.
- OBLIGATION FORCES EFFORTS AND INVESTMENT INTO CONTAMINANT INVESTIGATIONS IN ORDER TO EITHER DISCLOSE OR TO CLAIM, E.G. "TO THE BEST OF ITS KNOWLEDGE THE VENDOR IS NOT AWARE OF THE PRESENCE OF WASTES OR CONTAMINANTS ON THE LAND WHICH WOULD ADVERSELY AFFECT THE PURCHASER'S INTENDED USE OF THE LAND."

ENVIRONMENTAL PROTECTION ACT

Part II S.14 of Ontario's Environmental Protection Act prohibits the discharge of a contaminant into the natural environment that causes or is likely to cause adverse effect.

ADVERSE EFFECT MEANS:

- a) impairment of the quality of the natural environment for any use that can be made of it,
- b) injury or damage to property or to plant or animal life,
- c) harm or material discomfort to any person,
- d) an adverse affect on the health of any person,
- e) impairment of the safety of any person,
- f) rendering any property, plant or animal life unfit for human use,
- g) loss of enjoyment of normal use of property, and
- h) interference with the normal conduct of business.

REGULATION UNDER THE ONTARIO ENVIRONMENTAL PROTECTION ACT

There are a number of specific legislative requirements under the Environmental Protection Act which can require a proponent to cleanup a site. However, the last resort in all cases is Part II, S17 of the Act which empowers the Director (of MOEE) to order any person, who causes or permits the discharge of a contaminant into the natural environment, to repair and/or prevent the injury or damage. Where the discharge has damaged or endangered, or is likely to damage or endanger existing water supplies, the person responsible for the discharge to provide alternate water supply.

This is commonly known as a Control Order.

Table 1 - Environmental Protection Act Sections Related to Site Cleanup

| | |
|----------------|--|
| Part II | General Provisions |
| Section 1 | Definition of Adverse Effect |
| Section 6 | Prohibition of Exceeding Regulatory Limits |
| Section 7 | Control Orders Related to Emissions/Discharges |
| Section 8 | Approvals to Construct, Alter, Extend or Replace |
| Section 13 | Notification of Section 6 |
| Section 14 | Prohibition of Discharging a Contaminant Which Causes Adverse Effect |
| Section 15 | Notification of Section 14 |
| Section 17 | Orders to Remediate |
| Section 18 | Study & Reporting of Preventative Measures |
| Part V | Waste Management |
| Section 27 | Approvals for Waste Management System or Disposal Site |
| Section 40 | Prohibition of Depositing Waste Except at Approved Sites |
| Section 41 | Prohibition on Using Waste Management System Unless Approved |
| Section 43 | Order for the Removal of Waste |
| Section 46 | Prohibition of Using Former Waste Disposal Site |

| | |
|---------------------|---|
| Part X | Spills |
| Section 92 | Notification of Spills |
| Section 93 | Restoration of the Environment |
| Section 94 | Directions by Minister |
| Section 97 | Orders by Minister |
| Part XI | Control Orders and Stop Orders |
| Section 124 | Control Orders |
| Section 128 | Stop Orders |
| Part XIV | Work Done by Ministry |
| Section 146 | Minister May Cause Things to be Done |
| Section 147 | Director May Cause Things to be Done |
| Part XV | Provincial Officers |
| Section 156 | Inspection by Provincial Officer |
| Section 160 | Seizure of Files/Samples |
| Section 167 | Hinder/Obstruct Provincial Officer |

REGULATION 347 (WASTES)

The following are requirements under Ontario Regulation 347 regarding waste:

- Hazardous waste which is classified as requiring secure landfill disposal must be taken to Laidlaw/Tricil in Lambton County (Sarnia).
- Asbestos waste must be handled, packaged, and transported according to specific regulations which ensure that the material is contained and dust is not generated.
- Waste generators must be registered with the MOEE, receive a generator registration number approval to transport waste, and register all hazardous waste streams which are produced, collected, handled, or stored.
- Changes to waste characteristics require registration of the waste stream.
- If wastes are stored or accumulated for a period longer than three months, the generator must notify the Regional Director within five days after the three month period.
- An emergency generator or waste registration number may be issued for spill or emergency situations. Eg. contaminated soil removed from leaking underground storage tanks.

- No generator may authorize shipment of waste without the proper completion of a waste transport manifest.
- Wastes must be packaged and marked according to the requirements of the Federal Transportation of Dangerous Goods Act.
- Wastes generated in Ontario may be transported to Quebec of the United States if the carrier has reason to believe that the intended receiver will complete the receiver portion of the manifest.
- The generator must complete Section A of the Waste manifest, retain copies 1 and 2, send copy 1 to the Director within three working days of the transfer, and retain copy 2 for two years.
- The generator should receive copy 6 of the manifest from the final receiver of the waste within a reasonable period of time (i.e. one month) to confirm reception of the waste, otherwise notification of this situation must be made to the Director.
- If waste is refused by the receiver and the waste is returned to the generator, the generator must accept the waste providing it has not been altered.
- Wastes shall be stored according to Ministry of Labour regulations for chemical storage facilities.
- No person shall discharge a contaminant into the natural environment at an amount greater than that prescribed by regulations.
- Except in accordance with a *Certificate of Approval*, no person shall alter, extend or replace any plant, structure, equipment, etc. that discharges a contaminant to the natural environment (other than water - see below re. OWR Act)).
- Except in accordance with a *Certificate of Approval*, no person shall alter a process or rate of production with the result that a contaminant may be discharged in to the natural environment (other than water).
- To issue a *Certificate of Approval*, the Director may require plans, specifications and other information relating to the process or equipment in question.
- No person shall operate a system where a *Certificate of Approval* is required unless the certificate has been approved and complied with.
- The Ministry shall be notified immediately of any discharge in excess of the provisions of regulations or *Certificates of Approval*, or is a result of a non-routine occurrence.
- Other approvals may be required, for example, under Section 53 of Ontario Water Resources Act if water is discharged to a natural water course.

REGULATION 346 AND REGULATION 337 (AIR)

Air emissions are regulated based on concentrations of contaminants impinging at a certain point dependent on building or site configurations. These configurations are shown with calculations for determining impingement characteristics, in the Appendix to Regulation 346. MOEE also issues a Summary of Point of Impingement Standards. This document lists materials in addition to those in Reg. 346 and ambient air quality criteria for many of these materials.

No person shall cause or permit to be caused a visible emission of more than 20% opacity, for a period of more than four minutes during any thirty minute period. Where any stationary source of air pollution malfunctions or changes in operation such that the emission of contaminants exceeds regulated levels, such an occurrence must be reported immediately to a provs waste, organic vapour or fume which emits over 100 ppm by volume of organic matter.

For *construction and demolition*, contaminants shall not be transported beyond property boundaries.

No person shall operate an *incinerator* (also an afterburner on control equipment) burning gaseous or liquid waste not covered specifically by regulation, except for provisions which are

For concentrations of parameters which are allowable, see the "Ambient Air Quality Criteria Regulation". (Regulation 337)

Odour emissions.

made within Certificates of Approval on a site-specific basis.

Emission testing/monitoring/sampling is frequently a requirement of Certificates of Approval. Ontario provides numerous "Source Testing Codes" which describe the methodology for compliance testing to C. of A. specifications.

REGULATION 356

OZONE DEPLETING SUBSTANCES (CHLOROFLOUROCARBONS - CFC'S)

Ontario was the first province in Canada to pass legislation which supports the intent of the Montreal Protocol. The "Ozone-depleting substances" amendment to the Ontario ENVIRONMENTAL PROTECTION ACT (PART VI) prohibited the manufacture and sale of aerosols and foam packaging made with CFCs, effective July 1, 1989. The amendment also set a framework to enable the Ministry of the Environment and Energy to prohibit and phase-out remaining CFC uses as soon as alternatives are found. The ministry's goal is to reduce Ontario's consumption of CFCs by more than half by 1993. Ontario will continue to regulate other CFCs where technically feasible. Search for "natural refrigerants" is still on-going; no alternative to CFCs such as R123 is officially sanctioned by MBS.

ONTARIO PHASE-OUT OF OZONE-DEPLETING SUBSTANCES AEROSOLS

| | |
|------------------|-------------------|
| Propellants | July 1, 1989 |
| Slurrying Agents | September 1, 1990 |

FOAMS

| | |
|------------------|--------------------|
| Rigid Packaging | July 1, 1989 |
| Flexible Foam | September 1, 1990* |
| Rigid Insulation | January 1, 1991* |

VENTILATING OF CFCs IN MOBILE AIR CONDITIONING SYSTEMS

July 1, 1991

STATIONARY AIR CONDITIONING SYSTEMS

Not set yet

* Beginning of phase-out period. Complete ban effective December, 1993 based on commercial availability of alternatives.

RECYCLING OF CFCs

- An amendment to Regulation 347 of the ENVIRONMENTAL PROTECTION ACT to facilitate the collection, handling, transportation and recycling of spent refrigerants from commercial and domestic cooling systems became effective September 1, 1990.
- Certification of handlers of CFCs now required.
- Use of "Blue Bottle" for capture, transport, and reuse of CFCs will become more common as long as alternatives are not available.

New Regulation Places Strict Limits on the Release of Halons

An Ontario regulation to control the release of halons became law on June 28, 1994. The regulation is based on a draft released last March for public comment.

The regulation requires certification of companies servicing halon fire-extinguishing equipment. The sale of new fire extinguishers and systems containing halons will be prohibited. Venting halons into the atmosphere when fighting fires intentionally set for training purposes, or any other reason, is prohibited. However, the use of halons for real-life fire fighting is still permitted. The manufacture of halons has ceased, but continued use under strictly controlled conditions will be permitted.

The regulation does not require homeowners to dispose of their portable halon fire extinguishers, but only to maintain them in accordance with manufacturers' instructions and contact the Underwriters' Laboratories of Canada (ULC) for disposal information.

Halons are used almost exclusively in fire-extinguishing equipment and in explosion suppression applications both industrial and residential. They are up to 10 times more damaging to the ozone layer than an equal amount of chlorofluorocarbons (CFCs).

The halon control regulation will be phased in according to the following timetable:

Effective immediately:

- the addition of Halon-2402 to existing equipment is prohibited;
- only certified halon companies are permitted to service halon equipment and to store or recycle halons;
- certified companies must meet ULC standards;
- large extinguishers or systems (greater than three kilograms) must be certified empty before being disposed of;
- small extinguishers (less than three kilograms) are exempt from disposal requirements.

Starting 1995:

- filling equipment with halons that was manufacture after 1994 is prohibited;
- the sale of new halon fire-extinguishing system is prohibited.

Starting 1996:

- the sale of new portable halon extinguishers is prohibited;
- the refill of existing portable extinguishers smaller than three kilograms with halons is prohibited.

Starting 1997:

- the addition of most HCFCs and HBFCs (hydrobromofluorocarbons) to fire-extinguishing equipment is prohibited (use of some HCFCs with very low ozone-depleting potentials will be permitted.)

For information on the servicing, dismantling or removal of halon equipment, contact ULC at 1-800-463-8244. Copies of the regulation can be obtained at the Ministry of Environment and Energy's Public Information Centre, 135 St. Clair Ave. W., Toronto, Ont., M4V 1P5; phone: (416) 323-4321 or call toll free 1-800-565-4923.

ONTARIO REGULATION 360 (SPILLS)

Every person who spills or has control of a spill of a pollutant must immediately contact the Ministry of Consumer and Commercial Relations, Fuel Safety Branch, Ministry of the Environment and Energy (MOEE), the municipality or region, the owner of the pollutant, and the individual who has normal control of the pollutant. The same individual or owner is required to do everything practical to prevent adverse affects and restore the natural environment.

DISPOSAL of the pollutant and affected environmental area (i.e., soil, water) must be done in accordance with Waste disposal regulations.

LOSS OF DAMAGE caused to property or the environment must be compensated by the responsible party or owner of the pollutant. (a "Polluter Pays" requirement)

Certain **EXEMPTIONS** apply to classes of spills according to Part V of the Ontario Regulation 360. Planned spills (from training sessions, etc.) can be exempt if previous approval has been obtained by the Director of the Ministry of Environment and Energy.

ONTARIO REGULATION 362 (PCBs)

PCBs wastes in Ontario are regulated by the Environmental Protection Act (EPA) Regulation 362.

Equivalent federal regulations exist known as "Storage of PCB Material Regulation".

Ontario Regulation 362 requires that PCB wastes be stored in a secure location, and that the storage site be approved by the Ontario Ministry of Environment. There are standards for storage of PCB wastes and reference is made to the federal governments document "Guidelines for the Management of Wastes Containing Polychlorinated Biphenyls (PCBs)" which describes storage procedures and storage area requirements. The basic requirements are that the site be secure and that spill containment be provided.

In practice, there are no means of disposing of PCBs in Ontario. Although facilities for the destruction of PCBs are available in other provinces and abroad, costs are prohibitive. An owner of PCB wastes must store them until methods of disposal become available.

The Province also requires approval to move PCBs. It is possible for an owner of multiple properties to consolidate the wastes in one location; but approval from the MOEE is required before they can be moved from one site to the other. MOEE often consults with the host municipality for comment. Approval for movement across municipal boundaries can be time consuming and potential host communities often refuse entry.

A fluorescent light ballast, being less than 1kg in weight, is exempt from the regulation. However it is the policy of MOEE that owners of multiple units such as industries, institutions, commercial establishments, etc. store waste fluorescent light ballasts for future disposal.

Many transformers are classed as PCB equipment because they contain mineral oil which has been contaminated by PCBs. In such cases where the PCB concentration is less than approximately 10,000ppm, methods are available for decontamination of the transformers to non PCB status. This work is done by several contractors in Ontario.

**"AS CRUDE A WEAPON AS THE
CAVE MAN'S CLUB, THE CHEMICAL
BARRAGE HAS BEEN HURLED
AGAINST THE FABRIC OF LIFE"**

by RACHAEL CARSON IN SILENT SPRING, 1962

GUIDELINES FOR THE CLEAN-UP OF CONTAMINATED SITES IN ONTARIO

- **OUTLINES COMPLETE PROCESS FOR
ASSESSMENT AND CLEANING UP SITES**

PHASE I: **Assessment - Phase I ESA**
 - A Qualitative Approach

PHASE II: **Site Sampling and Analysis - Phase**
 II ESA
 - A Quantitative Approach

PHASE III: **Site Clean-up**

PHASE IV: **Completion of Clean-up**
 - Notice of Clean-up by
 Proponent submitted to MOEE
 - Registration of Certificate of
 Prohibition where necessary.
 - MOEE acknowledges Notice.

GUIDELINES FOR THE CLEAN-UP OF CONTAMINATED SITES IN ONTARIO

- **Presents Numerical Guidelines For 117
"Parameters"**
- **Rationale For Guidelines Considers The
Potential For Soil Contaminants To Affect The
Health Of Plants, Animals, And People**
- **Parameters Include Metals (Inorganics) and
Petroleum Products (Organics)**
- **Separate Numeric Guidelines For Residential
And Industrial Lands**
- **Any Exceedance Of These Numeric Guidelines Is
Cause For Concern**

ONTARIO WATER RESOURCES ACT (OWRA)

Water discharges are regulated by the OWR Act under both provincial and municipal (regional) jurisdictions, depending on whether the discharges are direct to a water course (provincial) or to a sewer system (municipal). If polluting direct discharges occur (non-routine), the Provincial Minister must be notified immediately. Groundwater contamination is regulated on a general basis through the Environmental Protection Act (see Table 1 above) as well as through the Ontario Water Resources Act.)

Table 2 - ONTARIO WATER RESOURCES ACT (OWRA)

| | |
|---------------|---|
| Section 28 | Definition of Impaired |
| Section 29 | Supervision of Surface and Ground Waters |
| Section 30 | Prohibition of Discharges of Polluting Material |
| Section 30(1) | Notification of Discharges |
| Section 30(2) | Prohibition of Discharges |
| Section 32 | Measures to Alleviate Impairment |
| Section 33 | Protection of Public Water Supplies |
| Section 34 | Permit to Take Water |
| Section 36 | Permit to Construct Well in Designated Area |
| Section 39 | Well Contractor Licence |
| Section 53 | Approvals for Sewage Works |
| Section 61 | Maintenance of Sewage Works |
| REG. 903 | Water Well Regulations |

Table 3 (below) describes the effluent parameter concentrations applicable to various municipalities/regions. Wastewater containing concentrations of these materials above the levels indicated are in non-compliance to municipal/regional bylaws.

The following materials are prohibited from discharge; fuels, PCB's, pesticides, severely toxic materials, hazardous waste chemicals, hazardous industrial waste, ignitable or reactive wastes, dyes or colouring materials which pass through a sewage treatment works, substances which can obstruct a sewer, materials which can cause an offensive odour.

Similar concentration limits exist for discharges to storm sewers, ditches, or other directly connected watercourses. Industrial discharge to these systems require approvals from the Ontario Ministry of the Environment and Energy.

For each region, water discharge control program may be specified by the municipality. These programs can include maintaining compliance, sampling and analysis, flow monitoring, installation of access manholes, and similar.

TABLE 3
EXAMPLE JURISDICTIONS
SANITARY SEWER BY-LAWS
CONCENTRATION (mg/l)

| PARAMETER | BRAMALEA (PEEL) | HAMILTON | MILTON (HALTON) | TORONTO |
|---------------------------|--------------------|-----------|--------------------|------------|
| pH | 5.5 - 9.5 | 5.5 - 9.5 | 6.0 - 10.0 | 6.0 - 10.5 |
| Mineral/ Synthetic Oil | 15 | 15 | 15 | 15 |
| Animal/ Vegetable Oil | 150 | 150 | 150 | 150 |
| BOD | 300 | 300 | 300 | 300 |
| Suspended Solids | 350 | 350 | 350 | 350 |
| Phosphorus | 10 | 10 | 10 | 10 |
| Kjeldahl Nitrogen | 100 | 100 | 100 | 100 |
| Phenols | 1 | 1 | 1 | 1 |
| Chlorides/ Sulphates | 1500 | 1500 | 1500 | 1500 |
| Aluminum, Iron | 50 | 50 | 50 | 50 |
| Chromium, Lead | 5 | 5 | 3 | 5 |
| Selenium, Tin | 5 | 5 | 5 | 3 |
| Nickel, Zinc | 3 | 3 | 3 | 3 |
| Cadmium | 1 | 1 | 1 | 1 |

**"INTERIM GUIDELINE FOR THE ASSESSMENT AND
MANAGEMENT OF PETROLEUM CONTAMINATED SITES IN
ONTARIO"**

- **PUBLISHED AUGUST, 1993**
- **ON-SITE INSPECTION AND ADVICE ON REMEDIATION OF PETROLEUM SPILLS, LEAKS AND RELEASES IS RESPONSIBILITY OF MINISTRY OF CONSUMER AND COMMERCIAL RELATIONS AS WELL AS M.O.E.E.**
- **OFF-SITE MATTERS AND IMPACTS SHOULD INVOLVE MINISTRY OF ENVIRONMENT AND ENERGY**
- **NUMERICAL GUIDELINES FOR "BTEX" COMPOUNDS (Benzene, Toluene, Ethylbenzene, Xylene) AND "TPH" (Total Petroleum Hydrocarbons)**
- **MINISTRY OF CONSUMER AND COMMERCIAL RELATIONS, REFERS TO THIS GUIDELINE AS "STANDARD GH13" IN GASOLINE HANDLING ACT.**

INTERIM GUIDELINES FOR THE ASSESSMENT AND MANAGEMENT OF PETROLEUM CONTAMINATED SITES IN ONTARIO (1993)

The purpose of these guidelines is to provide interim clean-up criteria for sites contaminated by petroleum products (primarily gasoline, diesel, and fuel and waste oils) released from underground storage tanks (USTs), aboveground storage tanks (ASTs), or lines/pumps. The guidelines specifically refer to contamination from retail and private fuel outlets and bulk transfer stations (excluding refineries and petrochemical plants). The guidelines are intended to be applied:

- a) when a recent known leak/release or adverse impact has been identified,
- b) when contamination is identified during equipment replacement or upgrading, and
- c) when a land use change is intended.

INTERIM SOIL REMEDIATION CRITERIA FOR PETROLEUM CONTAMINATION. SITE SENSITIVITY

| Contaminant | Level I (High) | Level II (Moderate) | Level III (Low) |
|-------------------------------|----------------|---------------------|-----------------|
| Benzene | 0.05 | 0.5 | 2.0 |
| Toluene | 1.0 | 10.0 | 100 |
| Ethylbenzene | 0.5 | 5.0 | 100 |
| Xylenes (total) | 1.0 | 5.0 | 50 |
| TPH ² (gas/diesel) | 100 | 1000 | 5000 |
| TPH (heavy oil) ² | 1000 | 5000 | 5000 |

ONTARIO DRINKING WATER OBJECTIVES FOR SELECTED PETROLEUM CONSTITUENTS.

| CONTAMINANT | DRINKING WATER OBJECTIVE ² |
|-----------------|---------------------------------------|
| Benzene | 0.005 |
| Toluene | 0.024 |
| Ethylbenzene | 0.002 |
| Xylenes (total) | 0.300 |
| Lead | 0.010 |

¹ ALL VALUES ARE ppm

² ONTARIO DRINKING WATER OBJECTIVES/CANADIAN DRINKING WATER GUIDELINES

GASOLINE HANDLING ACT

- **GOVERNS HANDLING OF GASOLINE**
- **GOVERNS DESIGN INSTALLATION AND PROTECTION OF ALL UNDERGROUND AND ABOVE GROUND STORAGE TANKS**
- **REQUIRES REMOVAL OF TANKS IF UNUSED FOR 5 YEARS [Reg. 439, Sec. 9(18)]**

ENERGY ACT AND FUEL OIL CODE

- **WHEN NOT IN SERVICE, FUEL OIL TANKS TO BE REMOVED AFTER 2 YEARS [Reg. 288, Section 5]**

PROVINCIAL CODES

- **N.B. MBS CODES, FOR EXAMPLE, B-44CSA CODE FOR ELEVATORS REQUIRING "DRY HOLES" FOR OIL LEAK CONTAINMENT**

THE GASOLINE HANDLING ACT

The Gasoline Handling Act is generally applicable to retail outlets, marines, bulk plants and transporters of gasoline and its associated products. However, there are also sections of the Act (particularly those concerning underground tanks) which are applicable to private outlets or sites which were used as private outlets.

The Act governs the following issues:

- approvals of equipment to be used for gasoline handling;
- licensing of retail outlets, marinas, bulk plants and transporters; and,
- registration of contractors who install an ' repair gasoline handling equipment.

The Gasoline Handling Code is a regulation made under the Gasoline Handling Act which outlines the specific requirements for the equipment that is to be used for the handling of gasoline and its associated products. It also specifies how the equipment should be installed, operated and removed. This equipment includes vehicles, piping and dispensing equipment, pumps, aboveground storage tanks as well as underground storage tanks. Under section 9 entitled "FIRE AND OTHER SAFETY PRECAUTIONS", the Code deals with underground storage tanks that are not in use at all locations (ie. including private outlets). If the tank has not been used for five years, then the owner must:

- remove any product from the tank and connected piping and dispensing equipment;
- remove the tank from the ground;
- remove the piping or purge the piping and permanently seal the ends;
- remove any product contaminated soil and product;
- fill the cavity with clean permanent fill; and,
- notify the chief inspector.

The Code also specified some measures which must be taken if the tank is to be taken out of service temporarily.

For aboveground tanks which are to be taken out of use for a period exceeding 180 days, the owner must empty the tank, make it vapour free, and mark the tank empty.

REGULATION 521/93 UNDER THE GASOLINE HANDLING ACT

Regulation 521/93 contains administrative provisions and fees, and adopts the Code which contains technical requirements.

The Code relates to requirements for underground and aboveground fuel storage tanks. Recent changes arise from concerns about the safety and environmental hazards caused by leaks and spills from these tanks.

The following are the significant changes in the new Code effective September 1, 1993.

UNDERGROUND STORAGE TANKS

1. Effective November 1, 1993 all new underground fuel storage tanks and piping are to be double wall, complete with interstitial space monitoring, internal overfill protection, and spill containment devices at the tanks and under the pumps.
2. Existing underground facilities with a submersible pump not presently equipped with a leak detection system shall be equipped with an approved leak detection system by December 31, 1995.
3. Single wall piping is allowed where suction pumps are used, providing a check valve is used immediately under the pump and there are no other restrictions to the tank.
4. All existing underground tanks are to be upgraded by the installation of internal overfill protection and spill containment devices at the tanks and under the pumps by December 31, 1993.
5. In addition to item (3), existing upgraded steel underground tanks, installed prior to May 1, 1974, require monitoring wells and impressed current cathodic protection in addition to item (3) by December 31, 1996.
6. Existing steel unprotected underground tanks at bulk plants and steel unprotected underground tanks for used oil storage shall be replaced by December 31, 1995.
7. Multi-compartment underground fuel storage tanks are allowed provided that the tank is used for the same class of product. The compartments themselves must be double walled.

8. Larger underground storage tanks are allowed at retail outlets as follows:

CAPACITY IN LITRES

| | <u>Existing</u> | <u>New Code</u> |
|------------------|-----------------|-----------------|
| Individual Tanks | 50,000 | 100,000 |
| Total Capacity | 250,000 | 500,000 |

9. Other approved methods for testing of underground tanks and pipelines are allowed in addition to pressure testing; for example vacuum testing, product displacement, and ultrasonics.

ABOVEGROUND STORAGE TANKS

1. All new dikes for aboveground tanks are required to meet strict permeability requirements. All existing dikes will be required to meet the new permeability requirements by December 31, 2000.
2. All new aboveground storage tanks in excess of 6000 litre capacity are required to be diked. Existing storage tanks in excess of 5000 litres will have to be diked by December 31, 2000.
3. Inspection requirements for aboveground tanks are introduced.
4. Aboveground tanks with self contained diking systems are allowed.
5. Up to 2500 litres of aboveground storage tankage is allowed for storing used oil at retail outlets.
6. Overfill protection and high level alarms are required for new aboveground fuel storage tanks at bulk plants. All existing bulk plants will be required to be upgraded with this equipment by December 31, 2000.

THE ENERGY ACT

The mandate of the Energy Act is to regulate the installation, filling, testing, maintenance, repair, removal, replacement, inspection and use of appliances or works which use hydrocarbons. There are five main regulations made under this Act which are as follows:

- Fuel Oil Code;
- Gas Pipeline Systems;
- Gas Utilization Code;
- Oil Pipeline Systems; and,
- Propane Storage, Handling and Utilization Code.

FUEL OIL CODE

The Fuel Oil Code is the adoption of the Canadian Standards Association "Installation Code for Oil Burning Equipment CSA B139-1976" as regulation but has additional regulations concerning tanks that are used to supply the Appliances. It requires that tanks be pressure tested if a leak is suspected and repaired if necessary. Under section 5 (RSO 1980), it is stipulated that where an underground tank has not been used for two years, the tank must be emptied and removed, the piping must be removed or purged and sealed, contaminated soil must be removed, and the tank cavity must be backfilled.

OCCUPATION HEALTH AND SAFETY ACT

- REGULATION 654/85 COVERS ASBESTOS MANAGEMENT AND REMOVAL
- REGULATION 644/88 ADOPTS THE "WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (WHMIS), AND ALSO REFERRED TO AS "HAZARDOUS MATERIALS INFORMATION REVIEW REGULATIONS"
- WHMIS IS DEFINED AS "A NATIONWIDE COMMUNICATION SYSTEM TO ENSURE THAT INFORMATION ABOUT THE HAZARDS OF MATERIALS PRODUCED OR SOLD IN, IMPORTED TO, OR SOLD WITHIN A WORKPLACE IS PROVIDED BY SUPPLIERS TO EMPLOYERS AND WORKERS".
- WHMIS IS A SYSTEM OF INFORMATION DELIVERY WITH THREE KEY ELEMENTS:
 1. *LABELS* ON HAZARDOUS MATERIALS AND THEIR CONTAINERS WHICH ALERT EMPLOYERS AND WORKERS TO THE DANGERS OF PRODUCTS AND BASIC SAFETY PRECAUTIONS.
 2. *MATERIAL SAFETY DATA SHEET (MSDS)* OR TECHNICAL BULLETINS WHICH PROVIDE DETAILED HAZARD AND PRECAUTIONARY INFORMATION ON THE PRODUCTS.
 3. *WORKER EDUCATION* PROGRAMS WHICH PROVIDE INSTRUCTION ON HAZARDS AND TRAINING IN WORK PROCEDURES.

ASBESTOS REGULATIONS

INTRODUCTION

Ontario has the following two asbestos regulations made under the Occupational Health and Safety Act:

- The regulation respecting asbestos in mining and manufacture of asbestos products, O. Reg 655/85 (old O.R. 570/82)
- The regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 654/85.

BACKGROUND TO THE ASBESTOS REGULATIONS

Asbestos was one of the first toxic substances to be regulated in Ontario workplaces. The Construction Safety Act, 1973, and The Industrial Safety Act, 1971 both referred specifically to asbestos.

In October 1979, all provincial health and safety legislation was consolidated under The Occupational Health and Safety Act, 1978. Once in force, section 41 of the Act allowed regulations to be made designating any substance, and once designated, prohibiting, regulating, or limiting its handling, exposure, use and disposal.

On June 28, 1980, the Ministry published a Notice of Intention to designate asbestos in The Ontario Gazette. This was followed by a proposed asbestos regulation on August 16, 1980. Also around this time a Royal Commission was appointed to "investigate all matters relating to health and safety arising from the use of asbestos in Ontario". On August 20, 1982 the Regulation respecting Asbestos, O. Reg 570/82 came into effect. This regulation applied to all work with asbestos except construction work.

Although the Regulation respecting Asbestos did not apply to construction projects, it had a broad application. It applied to manufacturers of asbestos products and other industries that used asbestos insulation or other asbestos-containing materials. It applied to every garage that did brake repair. If office workers were concerned about asbestos exposure because of asbestos insulation in their building, it was O. Reg 570/82 that applied to their situation. All this was to change with the Report of the Royal Commission on Asbestos.

The Royal Commission's report was tabled in the Legislature in May 1984. The Commission endorsed the control by procedure approach taken in the proposed regulation for asbestos on construction projects and recommended that it be extended to activities that involve maintenance and custodial work that disturbs asbestos insulation in a building. The Commission also pointed out that O. Reg 570/82 was inappropriate for brake repair work.

The Commission's recommendations were accepted and extended. Brake repair was not the only a type of repair operation that would be covered more appropriately by a procedural regulation. The proposed asbestos construction regulation became the Proposed Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations. This

meant that Ontario Regulation 570/82 had to be amended to restrict its application to work not covered by the new asbestos regulation. On December 16, 1985, two regulations were filed with the registrar of Regulations. One was the new asbestos regulation: the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, O. Reg 654/85. The second was a regulation that amended the existing asbestos regulation, Ontario Regulation 570/82. This regulation now would apply only to the mining of asbestos, the manufacture of asbestos products, and employers who had established an asbestos control program prior to the filing date of O. Reg 654/85, December 16, 1985.

OVERVIEW OF ONTARIO ASBESTOS REGULATION 654/85

The major requirements of building owners under this regulation include:

- Provision of a report outlining the locations and content of friable material in the building to all prospective contractors who are likely to handle or disturb the material.
- advising the workers of the building owner who may work in close proximity to a friable asbestos-containing material and who may disturb the material of its presence.
- periodic inspection (surveillance) of the material to determine its condition
- implementation of appropriate control measures, where required, following the precautions of procedures prescribed by the Regulation of Type 1 (minimum potential exposure), Type 2 (medium potential exposure), or Type 3 (highest potential exposure) operations
- establishment of a training program for employees of the owner who are likely to handle the material
- annual submission of an asbestos work report form for each employee working in a Type 2 or Type 3 operation
- removal of friable asbestos-containing materials, to the extent practical, prior to demolition of a building or part thereof

The real heart of the Regulation 654/85 is the requirement for work to be classified, according to the likely risk of exposure to asbestos that it presents, into one of the three categories. Work that is classified as Type 1 may result in a minimal exposure to asbestos fibres but should present almost no risk of disease. Type 2 exposures are associated with work that results in greater air concentration of asbestos. Type 3 work will produce the highest asbestos fibre levels. It is the classification of the work that determines what other provisions of the regulation will come into effect.

TYPE CLASSIFICATION OF ASBESTOS WORK

| | |
|--------|--|
| TYPE 1 | <ul style="list-style-type: none"> - installation or removal of manufactured asbestos products - cutting and shaping of asbestos products with hand tools - cutting, grinding or abrading an asbestos product with a power tool equipped with a dust collection device and HEPA filter - drilling a manufactured asbestos product - drywall removal where asbestos joint filling compounds were used |
| TYPE 2 | <ul style="list-style-type: none"> - the removal of a false ceiling with a significant quantity of asbestos-containing material on its surface - minor removal or disturbance of friable asbestos-containing material - enclosure of friable material containing asbestos - application of tape, a sealant or other covering to pipe or boiler insulation containing asbestos |
| TYPE 3 | <ul style="list-style-type: none"> - removal (other than minor removal) of friable asbestos-containing material - spray application of a sealant to friable asbestos-containing material - cleaning or removal of air-handling equipment in a building that has sprayed fireproofing containing asbestos - repair, alteration or demolition of a kiln or furnace made, in part of asbestos-containing refractory materials - cutting, grinding or abrading an asbestos product with a power tool not equipped with a dust collection device and a HEPA filter. - repair, alteration or demolition of a building in which asbestos products were manufactured |

It is noted that all asbestos removed under the above noted Regulation 654/85 and procedures, must then be disposed of under Regulation 347 of the Environmental Protection Act.

THE ENVIRONMENTAL BILL OF RIGHTS (EBR)

- PROCLAIMED FEBRUARY, 1994
- REQUIRED EACH MINISTRY TO MAKE A "STATEMENT OF ENVIRONMENTAL VALUES";
- ACKNOWLEDGES THE PUBLIC'S RIGHT TO A HEALTHY ENVIRONMENT;
- PROVIDES THE PUBLIC WITH MORE OPPORTUNITIES TO PARTICIPATE IN ENVIRONMENTAL DECISION-MAKING, AND AT AN EARLIER STAGE;
- INCREASES GOVERNMENT ACCOUNTABILITY AND RESPONSIBILITY FOR THE ENVIRONMENT;
 - EG. PUBLIC HAS RIGHT TO APPLY FOR AN INVESTIGATION OF AN ALLEGED CONTRAVENTION OF AN ACT OR REGULATION PRESCRIBED IN E.B.R. (PART V)
- PURPOSES OF THE ACT PROMOTE THE SUSTAINABILITY OF THE ENVIRONMENT AS WELL AS ITS PROTECTION;

THE ENVIRONMENTAL ASSESSMENT ACT

- **THE MBS CLASS EA APPROVED BY MOE ON DECEMBER 9, 1992, APPLIES TO ONTARIO REALTY CORPORATION**
- **THE PURPOSE OF THE CLASS EA DOCUMENT IS TO ESTABLISH AN APPROVED PROCEDURE WHICH ENABLES ORC TO PERFORM ENVIRONMENTAL ASSESSMENT (EA), CONSISTENTLY, OVER THE WIDE VARIETY OF ACTIVITIES WHICH FALL UNDER ORC RESPONSIBILITY**
- **THE MAIN GOALS OF THE ORC CLASS EA:**
 1. **Allows ORC To Match The Potential Impact Of Its Undertakings With The Appropriate Level Of Assessment;**
 2. **Support And Further The Ontario Government's Policies And Objectives, Particularly Those Concerning Affordable Housing, Disposal Of Government Land And The "GREENING" Of The Development Process;**
 3. **Resolve Issues Of Proponency (Whose EA Process To Use?);**
 4. **Minimize ORC And Provincial Liability ;**
 5. **Protect The Environment.**

ONTARIO REALTY CORPORATION ENVIRONMENTAL PROTECTION AND LIABILITY THROUGH ENVIRONMENTAL ASSESSMENT

Across Ontario, the Ontario Realty Corporation (ORC) owns and manages a large portfolio of real property. This real property includes such institutions as courts, jails and psychiatric hospitals as well as leased lands.

ORC may be called upon to do just about anything with real property. On December 9, 1992 a Class Environmental Assessment (Order in Council 3540/92) for all its real property undertakings was approved. This Class EA which applies to ORC, formalizes early planning procedures which have been in effect for some time. ORC Environmental Assessment requirements address environmental protection and liability in an efficient and cost-effective way.

The Class EA categorizes ORC undertakings into four groups which reflect their degree of potential environmental impact, as follows:

CATEGORY A projects, largely including routine repair and maintenance undertakings, require no EA action beyond verification of the proper category. These projects may include repainting, relamping or lawn cutting.

CATEGORY B projects include construction, land use changes under the Planning Act, acquisitions and sales. these projects undergo a six-point provisional site-specific analysis and consultation with the directly affected public.

CATEGORY C projects require more detailed EA analysis, including need and alternatives to the undertaking, which cannot be satisfactorily addressed in the Category B process.

CATEGORY D projects require a full, individual EA, as they have potential for significant, broad and unpredictable impacts. Examples would be the construction of a new psychiatric hospital or jail.

Most ORC projects fall in Category B. ORC agents carry out the six-point site specific analysis. The six points are:

- 1) **OFFICIAL PLAN and ZONING STATUS**
- 2) **SERVICING CAPACITY**
- 3) **CONTAMINANTS**
- 4) **HERITAGE**
- 5) **ENVIRONMENTALLY SIGNIFICANT AREAS (ESAs)**
- 6) **DISTINCTIVE ENVIRONMENTAL FEATURES**

The information prompted by these six points supplements the other traditionally-collected site information on ownership, location, price and/or estimated value.

ORC agents are aware of the many opportunities to see relationships between the checkpoints, e.g. stormwater managements capacity and topography. If such relationships appear to have a bearing on the feasibility of a project, further investigations with experts can be conducted.

The quality of this analysis may depend as much on public consultation findings as on technical research. Consultation with the directly affected public is a major part of ORC's site analysis. Each of the six points involve at least one contact with a local or provincial official or members of the public.

ORC's operational objective is to integrate and mainstream environmental concerns into ORC operations, without extra internal staff. ORC takes the approach that, with some training and orientation, existing staff will take on most of what might have been previously considered "EA" matters. At the present time, two existing staff members act as advisors to the ORC Province-wide operational staff to ensure that the intent of the Class EA is met.

More than ever before, ORC staff understand that real estate is a highly interdisciplinary and interactive activity. ORC staff are aware that they do not have to be rocket scientists to do "EA", or to fulfil environmental obligations. They regularly call upon private consultants in planning, biology, hydrogeology, contaminant assessment, archaeology, forestry or any area of expertise that may be needed.

CONCLUSION

While ORC Realty Group staff do not call themselves ecosystem planners yet, they are major land stewards in Ontario. From that basic fact, it follows that ORC should have one of the most environmentally sound approaches to land management, planning and development in Ontario. This approach not only empowers existing staff to make environmental judgements based on their own first-hand site knowledge, but also enables ORC staff to call upon the relevant science and expertise as required. ORC believes it now has such an approach in the new Class EA and the staff to implement it.

ORC staff are able to protect the environment and avoid liabilities in a cost-effective and efficient way through this practical approach to Environmental Assessment.

PROVINCIAL WATER QUALITY OBJECTIVES (PWQO)

- **Latest Revision - July 1993**

ONTARIO DRINKING WATER OBJECTIVES (ODWO)

- **Latest Revision - Summer 1993**

PESTICIDES ACT

- **Requires licensing for any pesticide application as per Section 5 of Act:**

"No person shall engage in, perform or offer to perform an extermination except under and in accordance with a licence of a prescribed class and except by the use of a pesticide of a class and under the conditions for use prescribed for that class of licence or unless exempt under the regulations."

"No person shall operate an extermination business except under and in accordance with a licence of a prescribed class or unless exempt under the regulations." (See also Reg. 914)

EXCESS SOIL AND MATERIALS HANDLING POLICY (PROPOSED)

- **Establishes the order in which decisions are to be made to manage excess materials;**
- **outlines the process for categorizing these materials; and**
- **expands the options for managing them.**

PLANNING ACT

- In 1995, the Province proclaimed far-reaching changes to Ontario's Planning Act.
- In defined environmental areas, developers such as the **ONTARIO REALTY CORPORATION**, must now take specific steps to ascertain the impact of their proposals on the environment.
- New Provincial Policy Statements, under these Planning Act reforms, lead all planning decisions in Ontario. That is, all local and regional municipality planning decisions must be **CONSISTENT WITH** these Policy Statements.
- One such Policy Statement (A 3.4) states:

"Development may be permitted on a contaminated site if the site is/has been rehabilitated or remediated and if it has been determined that no danger to public health or property damage would result."
- This particular Policy Statement further emphasizes the need for ORC to anticipate and budget for contaminant related costs of an investigative/analytical nature and actual clean up costs.

Candidate Substances List for Bans or Phase-Outs

Ontario Ministry of the Environment
April 1992

In June 1991 the Ontario Ministry of the Environment's Hazardous Contaminants Branch and Water Resources Branch were directed to establish a list of candidate substances to be considered for banning, phasing out or use/release reductions. The results were: (i) a process for selecting the substances, (ii) primary and secondary lists of substances for consideration, (iii) a review of the data on loadings of the primary list substances to receiving waters from industrial and municipal direct point source dischargers, (iv) a hazard evaluation of industrial and municipal effluents monitored under MISA* and (v) a review of the receiving water impacts, including sediment and biota impacts, attributable to point and non-point source inputs of substances on the Primary List.

The Primary List of Candidate Substances for Bans or Phase-Outs is a list of substances present in or discharged to Ontario surface waters which, out of the approximately 800 substances assessed, *are most inherently hazardous due to their persistence in water or sediment, potential to bioaccumulate and toxicity*. It is recommended that these substances be given first priority in considering candidate substances for banning, phasing out, or use/release reduction.

The Primary List is composed of the following 21 substances or substance groups:

- anthracene
- arsenic
- benzo[a]pyrene
- benzo[ghi]perylene
- benz[a]anthracene
- DDT (+ DDD & DDE)
- 1,4-dichlorobenzene
- 3,3'-dichlorobenzidine
- dieldrin
- hexachlorobenzene
- alpha-hexachlorocyclohexane (α -HCH)
- gamma-hexachlorocyclohexane (γ -HCH)
- mercury
- mirex
- pentachlorophenol
- perylene
- phenanthrene
- polychlorinated biphenyls (PCBs)
- polychlorinated dibenzo-p-dioxins and -furans (PCDD/Fs)
- toxaphene
- tributyl tin

* Municipal-Industrial Strategy for Abatement, a program under which effluent from industrial and municipal sources directly discharged to surface water are monitored and regulated.

THE CLASS ENVIRONMENTAL ASSESSMENT SIX POINT CHECKLIST

- **APPLIED TO CATEGORY B PROJECTS**
 - purchases, sales, construction, change in use, clean-ups
- **CHECKLIST REQUIRES ASSESSMENT OF:**
 1. **LAND USE**
 - Zoning and Planning Status
 2. **HERITAGE**
 - Historical, Archaeological and Architectural Significance
 3. **SERVICING CAPACITY**
 - Impact on Capacity of Servicing System
 4. **ENVIRONMENTALLY SIGNIFICANT AREAS**
 - Known Unique Environmental Areas of Ontario
 5. **DISTINCTIVE ENVIRONMENTAL FEATURES**
 - Other Noticeable Environmental Site Features
 6. **CONTAMINANTS**
 - Determine Need for Initial Contaminant Study (Ph I ESA)

See What "Triggers" a PhI ESA On Section 5,
Page 5

ORC CONSULTATION AND DOCUMENTATION RECORD (SITE CHECKLIST IN COMPLIANCE WITH SECTION 6 OF CLASS EA)

File/Project No: _____

Administrator/Project Manager's Name _____

PART I - PROJECT CATEGORIZATION (Ref: Class EA Section 1-7)

- 1) Determine if Client Ministry/Municipality has an applicable E.A. process and/or approval for the undertaking in question.

If YES, receive written confirmation from client/municipality that it has obtained, or intends to obtain, approval under their process and/or approval. In this case, no further EA work is required by ORC.

If NO, use ORC process, below.

- 2) Identify provisional Category of Project--i.e. A, B, C or D?
(Ref: Class EA Fig.2.1, Category Listing Matrix and Appendix 1)
- 3) Verify Category (Ref: Class EA Section 8)
- 4) If Category is in doubt, use screening questions.
(Ref: Class EA Table 2.1)
- 5) For Category A projects, proceed without further E.A. action unless an heritage feature of the site or building is involved. If heritage is involved, Category B (PART III, below) is required.
- 6) For Category C projects, reference Class EA Section 4.
- 7) For Category B projects, complete remainder of this Checklist.

PART II - PROJECT AND SITE DESCRIPTION

1) IDENTIFY UNDERTAKING/ACTIVITY

Letting with change in land use _____

Sale, Transfer, Disposal _____

Easement _____

Purchase _____

Leasing Private Property with Change in land Use _____

Construction _____

Reconstruction _____

Addition _____

Demolition _____

Application For Change in Land Use _____

Any undertaking affecting an heritage resource _____

Decommissioning or clean-up _____

Other (Specify: Ref-Class EA Fig. 2-1) _____

- 2) Client Agency, Board or Commission: _____
- 3) Site Tenant: _____
- 4) Intended Land Use of Site (Zoning) _____
- 5) SITE DESCRIPTION

Lot: ____ Con.: ____ Twp.: ____ (ATTACH SITE PLAN)

Site Municipal Address: _____

Site Area(hectares): _____

Existing No. and Type of Site Buildings _____

PART III - SITE ANALYSIS,CONSULTATION AND DOCUMENTATION.
(Ref: Class EA Sec. 4.4)

1) LAND USE STATUS, CONTACTS AND SOURCES

- a) Official Plan: _____
Contact: _____
- b) Zoning status: _____
Contact: _____
- c) Floodplain: _____
Contact: _____
- d) Prime agricultural land (class 1-4): _____
Contact: _____
- e) Specialty crop land: _____
Contact: _____
- f) Environmentally Significant Areas: _____
Contact: _____
- g) Are there surface or underground easements on the site?
Specify: _____
- h) Has the site been subject of news reports regarding its current
or future use? (attach clippings, if available)
- i) From the above contacts/research, in your opinion, would intended
land use conflict with current land use?:YES ____ NO ____
- j) If YES, has ORC, or anyone else, applied for a change in land
use under Planning Act? Describe resolution of this issue in
Part IV, below.

2) CONTAMINANTS

- a) Visual Inspection Date: _____
- b) Is there evidence on land or in buildings of any of the following:
- | | |
|---|------------------------------------|
| ___ incineration | ___ fill added |
| ___ leaking or unprotected underground or above-ground fuel storage tanks | |
| ___ stained surfaces | ___ vegetation damage |
| ___ oily sheens on water | ___ discarded batteries |
| ___ unprotected industrial drums | ___ friable (crumbling) asbestos |
| ___ burials | ___ ureaformaldehyde |
| ___ PCB ballasts/transformers | ___ pesticide/herbicide containers |
| ___ chlorofluorocarbons, refrigerants not in use | |
| _____ signs of above-noted items on adjacent properties? | |
| _____ other? (specify) | |
- c) Consult with neighbours, owners, tenants, municipal officials or Provincial officials with respect to:
- i) Current and previous use (eg. storage, gas-vehicle repair station, printing, dry cleaners, photo lab, waste processing) _____?
 - ii) Adjacent Uses _____?
 - iii) Fuel Storage Tanks (Min. of Consumer and Commercial Relations, Fuel Safety Branch) _____?
 - iv) Records of old landfills or previous complaints or violations on site (MOEE district office) _____?
 - v) Water Well Presence-Water Quality _____
 - vi) Use of Potentially Hazardous Substances On Site (eg. pesticides, batteries, chemicals) _____?
 - vii) Other Findings (eg.-natural gas wells, radon gas, radioactivity) _____?
- d) Have other contaminant assessments taken place on this site _____?
- e) In your opinion, does site contain evidence of contamination?
(A "YES" answer is warranted if there is question of the nature or extent of contamination or the use of hazardous substances.) YES _____ NO _____
- f) If YES, recommend a Phase I Environmental Site Assessment (contaminant assessment) be done in PART IV.

- 3) **HERITAGE - In Ontario, Heritage Resources may include:**(i) Buildings, Structures or Ruins, (ii) Archaeological sites, (iii) Cultural Landscapes, and (iv) Places with Sacred or Secular Value.
- Does any ORC inventory state that the effected property has NO heritage significance? If YES, go to 4, below. If NO, go to 3(b).
 - Does the municipality or its Local Architectural Conservation Advisory Committee (LACAC) or other heritage interest group (eg. First Nations) consider the effected property to have heritage significance? If YES, go to 3(d). If NO, attach reply to checklist, copy ORC inventory, and go to 4. If UNKNOWN, go to 3(c).
 - Does Min. of Culture, Tourism and Recreation (MCTR) consider the effected property to have heritage significance? If YES or UNKNOWN, go to 3(e). If NO, attach reply to checklist, copy MBS inventory and go to 4.
 - Does municipality or LACAC consider that undertaking will affect the heritage aspect of the effected property? If YES or UNKNOWN, note same in PART IV and proceed with Heritage Significance Study. If NO, attach reply to checklist, copy ORC inventory and go to 4.
 - Does MCTR consider that undertaking will affect the heritage aspect of the effected property? If YES or UNKNOWN, note in PART IV and proceed with Heritage Significance Study. If NO, attach reply to checklist, copy ORC inventory and go to 4.
- 4) **ENVIRONMENTALLY SIGNIFICANT AREAS (ESAs) (Ref:Class EA GLOSSARY)**
- M.N.R. contact:
Wetlands? Areas of Natural and Scientific Interest? (ANSIs)
Habitats designated by Endangered Species Act, OR 287?
Habitats designated or proposed of rare, threatened or endangered species?
 - Conservation Authority contact:
ESAs?
Floodplains?
 - Municipal contact:
ESA designation in Official Plans?
Groundwater recharge sites?
 - Niagara Escarpment Plan re: Natural or Rural Areas?
 - Environment Canada, Environmental Assessment Co-ordination Committee: Any Federal lands?
 - Is site part of, or adjacent to, an ESA? : YES ___ NO ___
 - If YES, describe ESA below and on attached site plan.
Description: _____
 - In your opinion, based on the above contacts and any current, relevant feasibility studies, could the intended use and project cause any local, long term changes large enough to threaten the ESA ? YES ___ NO ___
 - If YES, hold further implementation until a Category C process is completed and note this resolution in PART IV, below.
 - Where the site is part of an ESA, and a sale or disposal is intended, is the purchaser a non-conservation body?
YES ___ NO ___

k) If NO, go to 5, below.

l) If YES, ensure the purchaser becomes a conservation body, or bump-up to a Category C process, or modify boundaries of sale to exclude ESA, or abandon sale and note resolution in PART IV, below.

5) DISTINCTIVE ENVIRONMENTAL FEATURES

a) Does visual inspection reveal any natural features (other than ESAs noted above) such as floodplain, high groundwater level, streams, rivers, natural corridors (eg. hedgerows), woodlots, wetlands, springs, water bodies, topography, prevailing slope direction, steep slopes, ravines, rock outcrops:
YES _____ NO _____

b) If YES, describe below, and on attached site plan.
Description: _____

c) Would any of the observed features affect the implementation of the project as currently planned? YES _____ NO _____

d) Do Municipal Authorities or interest groups indicate that any of the observed features warrant protection?
YES _____ NO _____

e) If YES, to either of the last two questions, describe effects and/or protection measures in PART IV.

f) If NO, go to 6, below.

6) SERVICING CAPACITY RE SEWERAGE, WATER, ROADS, GAS, HYDRO, ETC.

a) Based on local municipality, MOEE or MTO or other contacts or current, relevant feasibility studies, will the intended use and project require new or different servicing?
YES _____ NO _____

b) If YES, specify your contact and new or different service below and relate servicing plan in PART IV, below.
Contact and new or different service? _____

c) Does Servicing involve a Septic System? YES _____ NO _____

d) If YES, note in PART IV and attach evidence and/or approvals supporting site's capacity to sustain a septic system for the intended use.

e) If well water is in use, is water undrinkable due to pollution?
YES _____ NO _____

f) If YES, specify source of pollution and note in "Contaminants" section above and describe resolution in PART IV, below.

g) If NO, cite your evidence: _____
and go to PART IV.

**PART IV - SUMMARY OF RESOLUTION TO "YES" ANSWERS, i.e. ACTION PLAN FOR IMPACTS,
MITIGATION AND MONITORING (Ref. Section 6 of Class EA)**

- 1) Land Use
 - 2) Contaminants
 - 3) Heritage
 - 4) Environmentally Sensitive Areas
 - 5) Distinctive Environmental Features
 - 6) Servicing Capacity
-

SIGN OFF

"I hereby certify, to the best of my knowledge at this date, that the above description of the undertaking and effected site is correct, that the directly affected parties noted on this RECORD were consulted by ORC, that the issues raised by the directly affected parties with regard to the above 6 site-specific points, including any impacts, mitigation, net effects and monitoring were dealt with as per the notes and attachments to this RECORD, and finally that the results of these investigations verify the CATEGORY B status of the undertaking."

SIGNATURE OF ORC ADMINISTRATOR/PROJECT MANAGER:

DATE:

ONTARIO REALTY CORPORATION CONTAMINANT CHECKLIST

- **A CHECKLIST, RELATING SOLELY TO CONTAMINANT QUESTIONS, IS AVAILABLE TO ALL ORC STAFF FOR USE IN DAY-TO-DAY WORK.**
- **THIS SELF-ADMINISTERED CONTAMINANT CHECKLIST WAS DERIVED FROM THE U.S. BASED ENVIRONMENT ASSESSMENT ASSOCIATION CHECKLIST AND IS BASED ON A WIDE RANGE OF EXPERIENCE FROM NORTH AMERICAN INVESTIGATIONS OF CONTAMINANTS.**

ONTARIO REALTY CORPORATION CONTAMINANT CHECKLIST

To Be Used By ORC Agents as an aid to determine the potential existence or absence of contaminants while fulfilling requirements of Class EA Category "B" Projects, i.e. transactions, land use changes, construction, etc.

INSPECTION DATA

Property Address _____

City _____ Area Code _____ Legal Description _____

Property Is ___ Vacant Land ___ Improved _____

Occupied By Whom _____ Phone () _____

- 1. Is the property or any adjoining property used for an industrial use?**

Owner: _____ Occupants (if applicable): _____
Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:
Yes ___ No ___ Unknown ___

- 2. To the best of your knowledge, has the property or any adjoining property been used for an industrial use in the past?**

Owner: _____ Occupants (if applicable): _____
Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:
Yes ___ No ___ Unknown ___

3. Is the property or any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?

Owner:

Yes ___ No ___ Unknown ___

Occupants (if applicable):

Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

4. To the best of your knowledge has the property or any adjoining property been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?

Owner:

Yes ___ No ___ Unknown ___

Occupants (if applicable):

Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

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LAND ISSUES

5. Are there currently, or to the best of your knowledge have there been previously, any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of greater than 5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?

Owner:

Yes ___ No ___ Unknown ___

Occupants (if applicable):

Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

- 6. Are there currently, or to the best of your knowledge have there been previously, any industrial drums (typically 55 gal (208 L) or sacks of chemicals located on the property or at the facility?**

Owner:

Occupants (if applicable):

Yes ___ No___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

7. Has fill dirt been brought onto the property that originated from a contaminated site or that is of an unknown origin?

Owner:

Occupants (if applicable):

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes No Unknown

8. Are there currently, or to the best of your knowledge have there been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?

Owner:

Occupants (if applicable):

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

9. Is there currently, or to the best of your knowledge has there been previously, any stained soil on the property?

Owner:

Occupants (if applicable):

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

10. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered storage tanks (above or underground) located on the property?

Owner: _____ **Occupants (if applicable):** _____
Yes ___ **No** ___ **Unknown** ___ **Yes** ___ **No** ___ **Unknown** ___

Observed During Site Visit:
Yes ___ No ___ Unknown ___

- 11. Are there currently, or to the best of your knowledge have there been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?**

Owner: Yes ___ No ___ Unknown ___ **Occupants (if applicable):** Yes ___ No ___ Unknown ___

Observed During Site Visit:
Yes ___ No ___ Unknown ___

STRUCTURE ISSUES

- 12. Are there currently, or to the best of your knowledge have there been previously, any flooring, drains, or walks located within the facility that are stained by substances other than water or are emitting foul odours?**

Owner: Yes ___ No ___ Unknown ___ **Occupants (if applicable):** Yes ___ No ___ Unknown ___

Observed During Site Visit:
Yes ___ No ___ Unknown ___

13. Is there any evidence of asbestos, urea formaldehyde foam insulation, lead hazard (flaking paint), pesticides/herbicides, PCB's, radon gas on the subject property? Specify _____

OTHER ISSUES

- 14. If the property is served by a private well or non-public water system, have contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as contaminated by any government environmental/health agency?**

Yes ___ No___ Unknown ___ Yes ___ No ___ Unknown ___

Yes ___ No ___ Unknown ___

- 15. Does the owner or occupant of the property have any knowledge of environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?**

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Yes ___ No ___ Unknown ___

- 16. Has the owner or occupant of the property been informed of the past or current existence of hazardous substances or petroleum products or environmental violations with respect to the property or any facility located on the property?**

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Yes _____ No _____ Unknown _____

- 17. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?**

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Yes ____ No ____ Unknown ____

- 18. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?**

Owner:

Occupants (if applicable):

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

- 19. Does the property discharge waste water on or adjacent to the property other than storm water into a sanitary sewer system?**

Owner:

Occupants (if applicable):

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

20. To the best of your knowledge, have any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials been dumped above grade, buried and/or burned on the property?

Owner:

Occupants (if applicable):

Yes ___ No___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

21. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCB's?

Owner:

Occupants (if applicable):

Yes ___ No ___ Unknown ___ Yes ___ No ___ Unknown ___

Observed During Site Visit:

Yes ___ No ___ Unknown ___

22. Do any government record systems list the property within the circumference of the area noted below:

Fuel Storage AreaYes No

Works Department Road Maintenance Yard..... Yes No

List of Hazardous Waste SitesYes No

Solid Waste/Landfill Facilities - within 0.5 mile
(0.8 Km)?Yes No

Other (specify)Yes No

23. Based upon a review of fire insurance maps or consultation with the local fire department serving the property, are any buildings or other improvements on the property or on an adjoining property identified as having been used for an industrial use or uses likely to lead to contamination of the property?..... Yes No

**24. In your opinion, does the property contain Yes No
evidence of contamination?**

(A 'yes' answer is warranted if there is any question of the nature or extent of contamination, or the use of hazardous substances on or adjacent to the property is suspected, or any suspicion exists of cross boundary migration of contaminants, or housing is a potential use).

If 'yes', recommend on Class EA checklist that a Phase 1 Environmental Site Assessment be done.

ORC agent represents that to the best of the ORC agent's knowledge the above statements and facts are true and correct, and to the best of the ORC agent's actual knowledge, no material facts have been suppressed or misstated.

ORC Agent's Signature

Date

NOTES:

WHAT TRIGGERS A PHASE I ENVIRONMENTAL SITE ASSESSMENT (Ph I ESA)?

- USE OF CLASS EA CHECKLIST WHERE SITE-SPECIFIC INVESTIGATIONS REVEAL:
 - (A) ANY OUTSTANDING QUESTION OF THE NATURE OR EXTENT OF SUSPECTED CONTAMINATION ON THE REAL PROPERTY
 - (B) ANY QUESTION ABOUT THE PAST USE OF SUSPECTED HAZARDOUS SUBSTANCES ON THE REAL PROPERTY
- SUSPICION OF ACROSS-BOUNDARY MIGRATION OF CONTAMINANTS
- SITES INVOLVING HOUSING OR CMHC FUNDING AUTOMATICALLY REQUIRE PHASE I ESA
- NEED FOR BASELINE INFORMATION IN CERTAIN TENANT SITUATIONS

THE PHASED APPROACH TO ENVIRONMENTAL SITE ASSESSMENT

- PHASE I:** Assessment - Phase I ESA
 - A Qualitative Approach
- PHASE II:** Site Sampling and Analysis -
 Phase II ESA
 - A Quantitative Approach
- PHASE III:** Site Clean-up
- PHASE IV:** Completion of Clean-up
 - Notice of Clean-up by
 Proponent submitted to MOEE
 - Registration of Certificate of
 Prohibition where necessary.
 - MOEE acknowledges Notice.

CONTAMINANT CHARACTERISTICS IN THE ENVIRONMENT

- * TOXICITY TO HUMANS AND ENVIRONMENT IN AMOUNTS
IN EXCESS OF CURRENT STANDARDS
- * CHEMICAL CHARACTERISTICS SUCH AS DENSITY,
SOLUBILITY, PERSISTENCE, BIODEGRADATION
- * MOBILITY AND MIGRATION
- * AIR DISPERSION
- * SURFACE WATER MIGRATION
- * SURFACE DEPOSITION AND LEACHING
- * GROUNDWATER TRANSPORT
- * UTILITIES AND CONDUITS

SOURCES---->

PATHWAYS---->

RECEPTORS

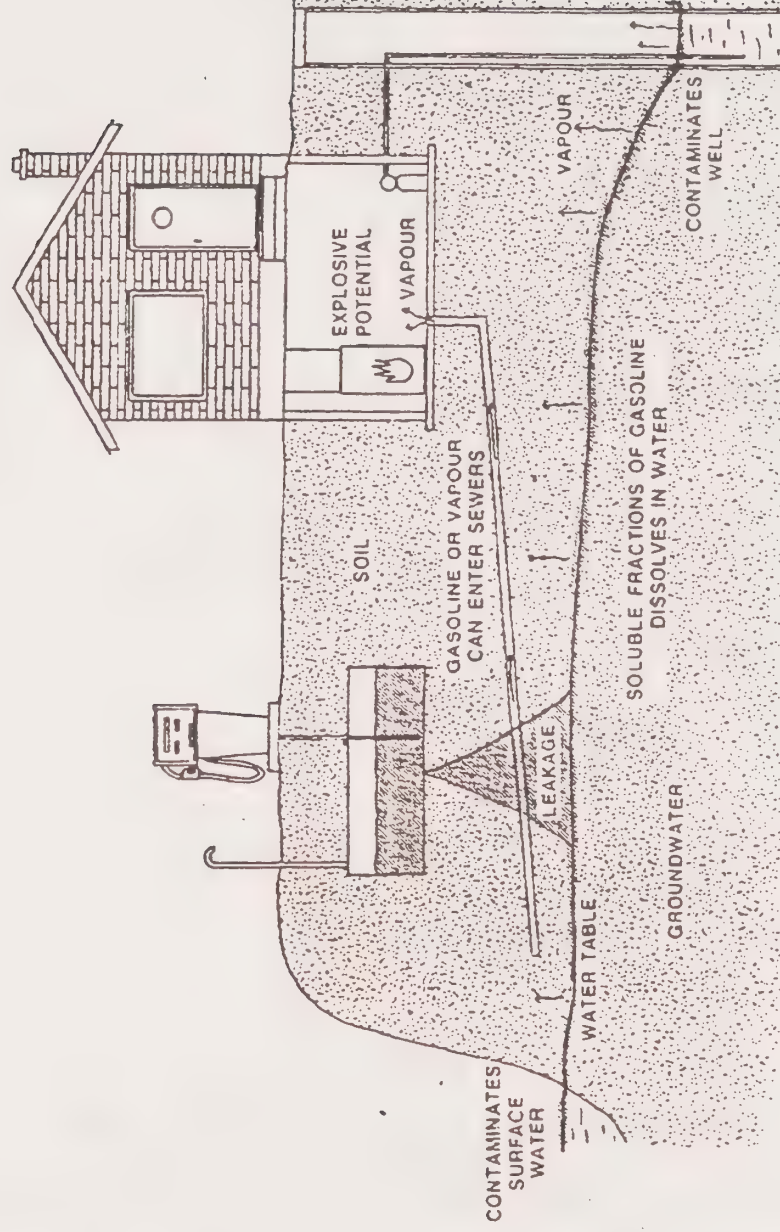
SOURCES

- MOST COMMON CONTAMINANT OF CONCERN TO MBS ON LAND IS PETROLEUM

- TYPES AND CHARACTERISTICS OF PETROLEUM PRODUCTS
 - Gasoline
 - Middle Distillates (i.e. Diesel Fuel, Kerosene, Jet Fuels, etc.)
 - Heavier Fuel Oils And Lubricating Oils
 - Waste Oil
 - Asphalt And Tars

- PHYSICAL PROPERTIES OF PETROLEUM WILL AFFECT HOW IT MOVES IN THE ENVIRONMENT
 - Density, Viscosity
 - Vapours Migrate Up Through Soil
 - Absorbed to Soil
 - Free Product Floats on Water Table
 - Partially Dissolves in Groundwater

LEAKING UNDERGROUND STORAGE TANKS



TANK LEAKAGE CAN CAUSE A NUMBER OF PROBLEMS

PATHWAYS

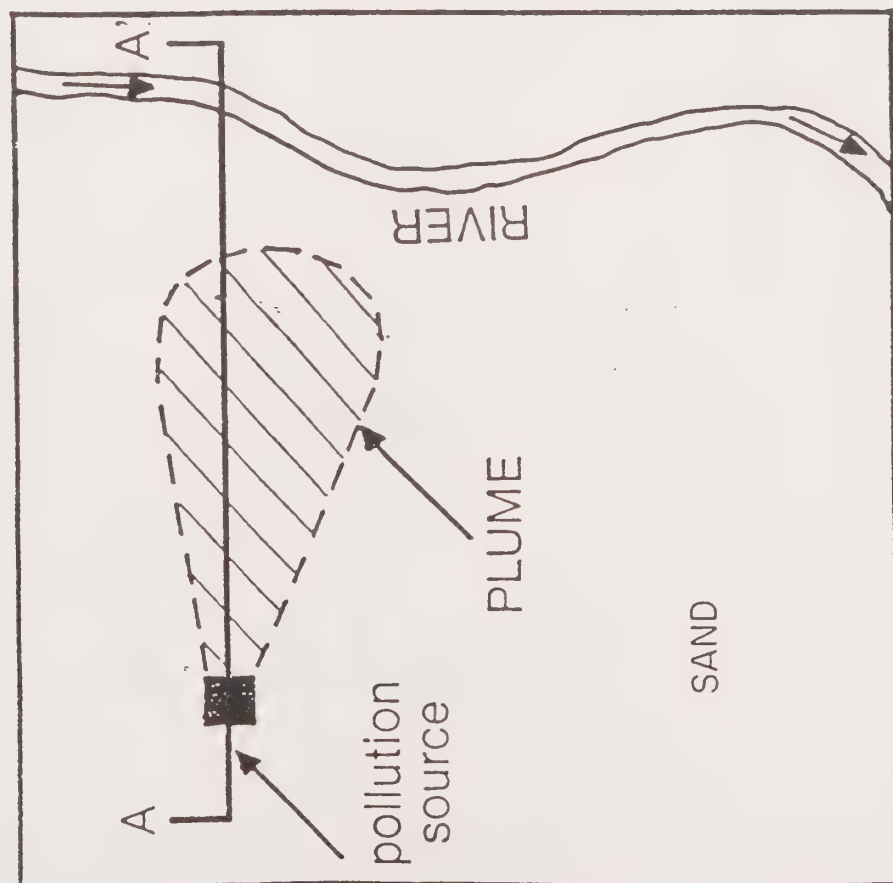
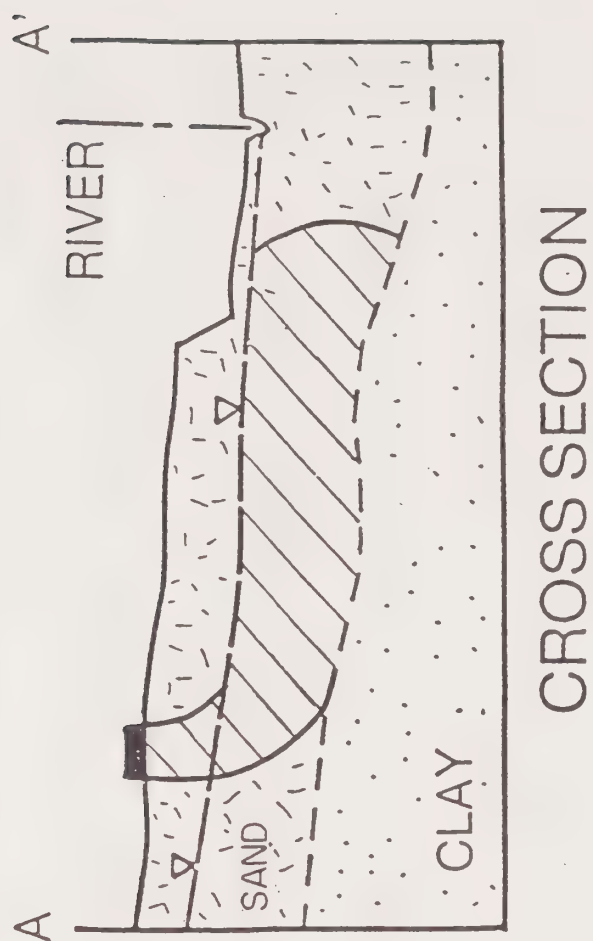
SOIL PROPERTIES

- SOIL TYPE
- SOIL PERMEABILITY
- DENSITY
- PARTITIONING
- POROSITY (TOTAL, EFFECTIVE)
- MOISTURE CONTENT
- ORGANIC CARBON CONTENT

GROUNDWATER CONDITIONS

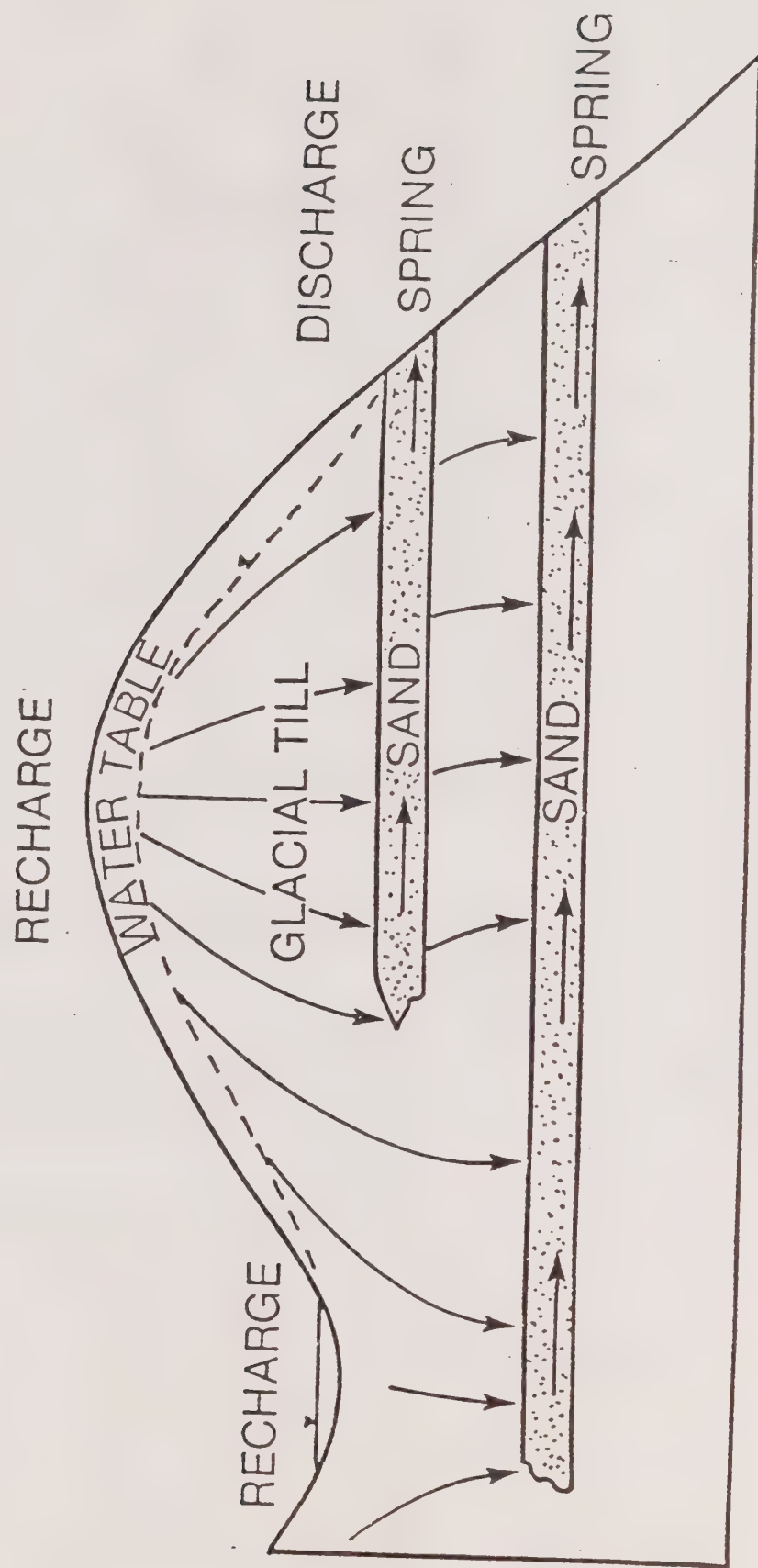
- DEPTH TO WATER TABLE
- DIRECTION OF GROUNDWATER FLOW
- HORIZONTAL AND VERTICAL GRADIENTS
- GROUNDWATER VELOCITY
- CHEMISTRY (ORGANIC, INORGANIC)
- NATURAL TEMPERATURE
- REDOX STATE

POLLUTION PLUME IN UNIFORM HYDROGEOLOGIC SETTING

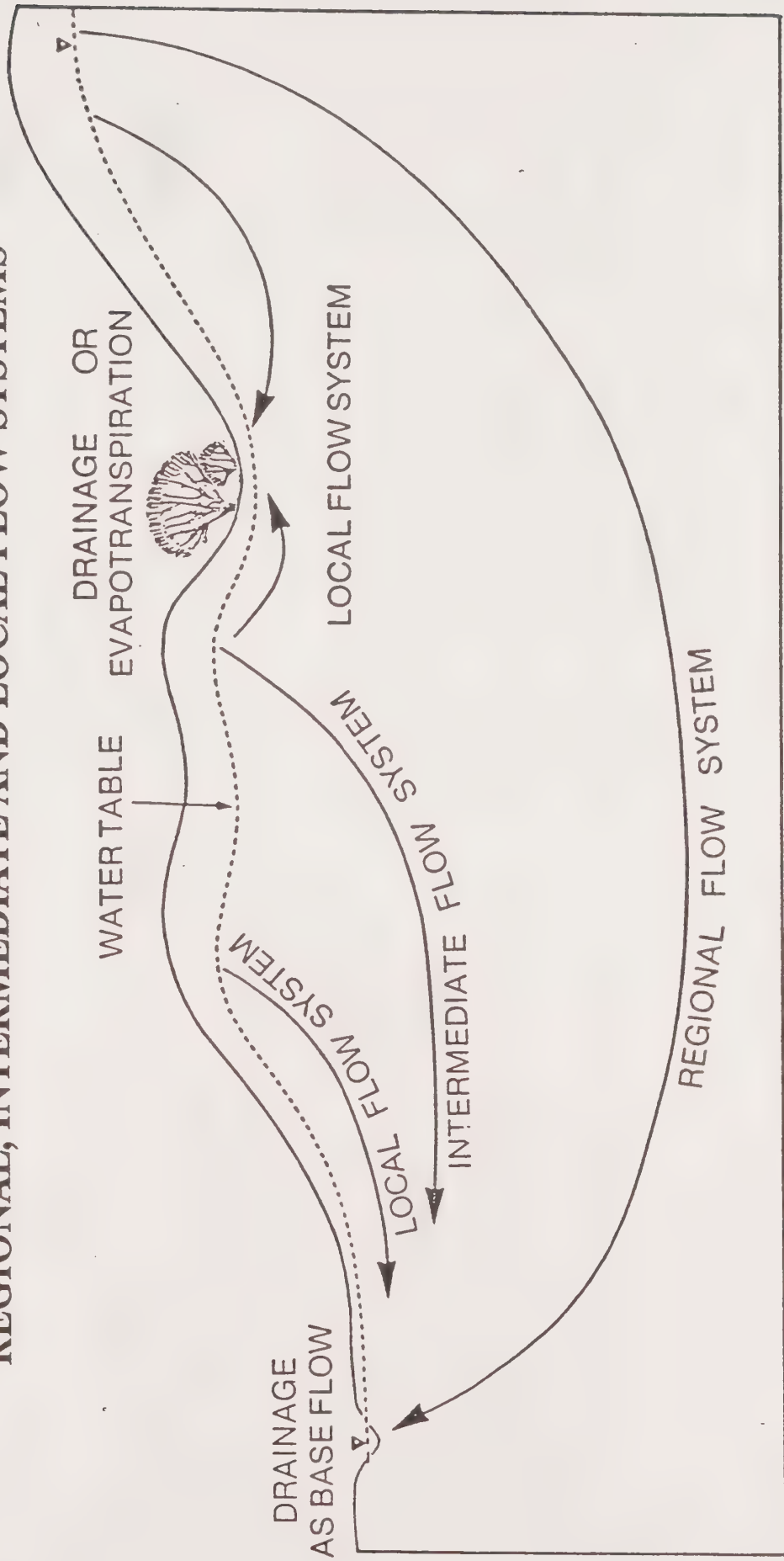


Adapted from Scalf et al., (1981)

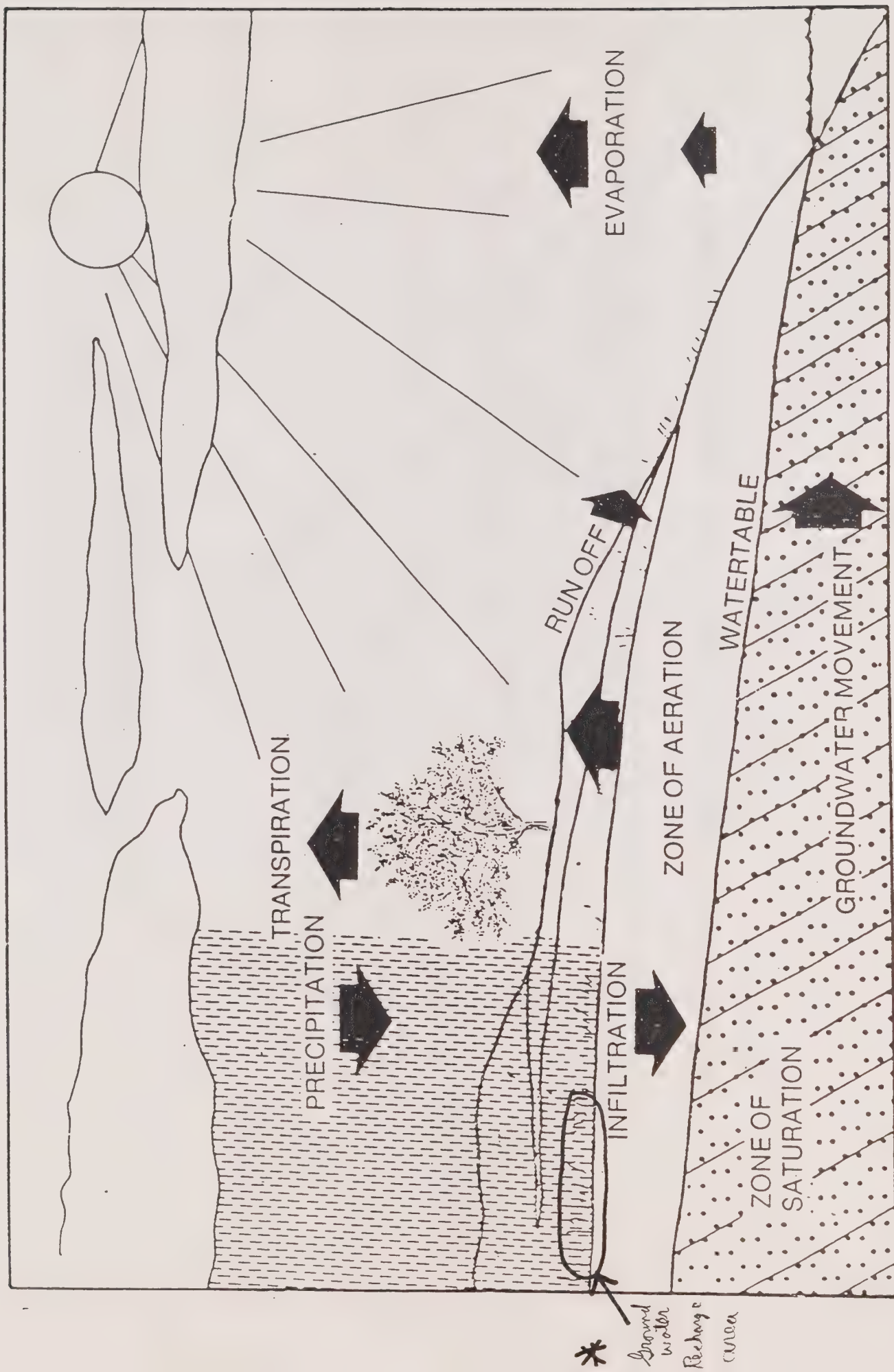
EFFECT OF TWO SAND LAYERS ON GROUND WATER FLOW



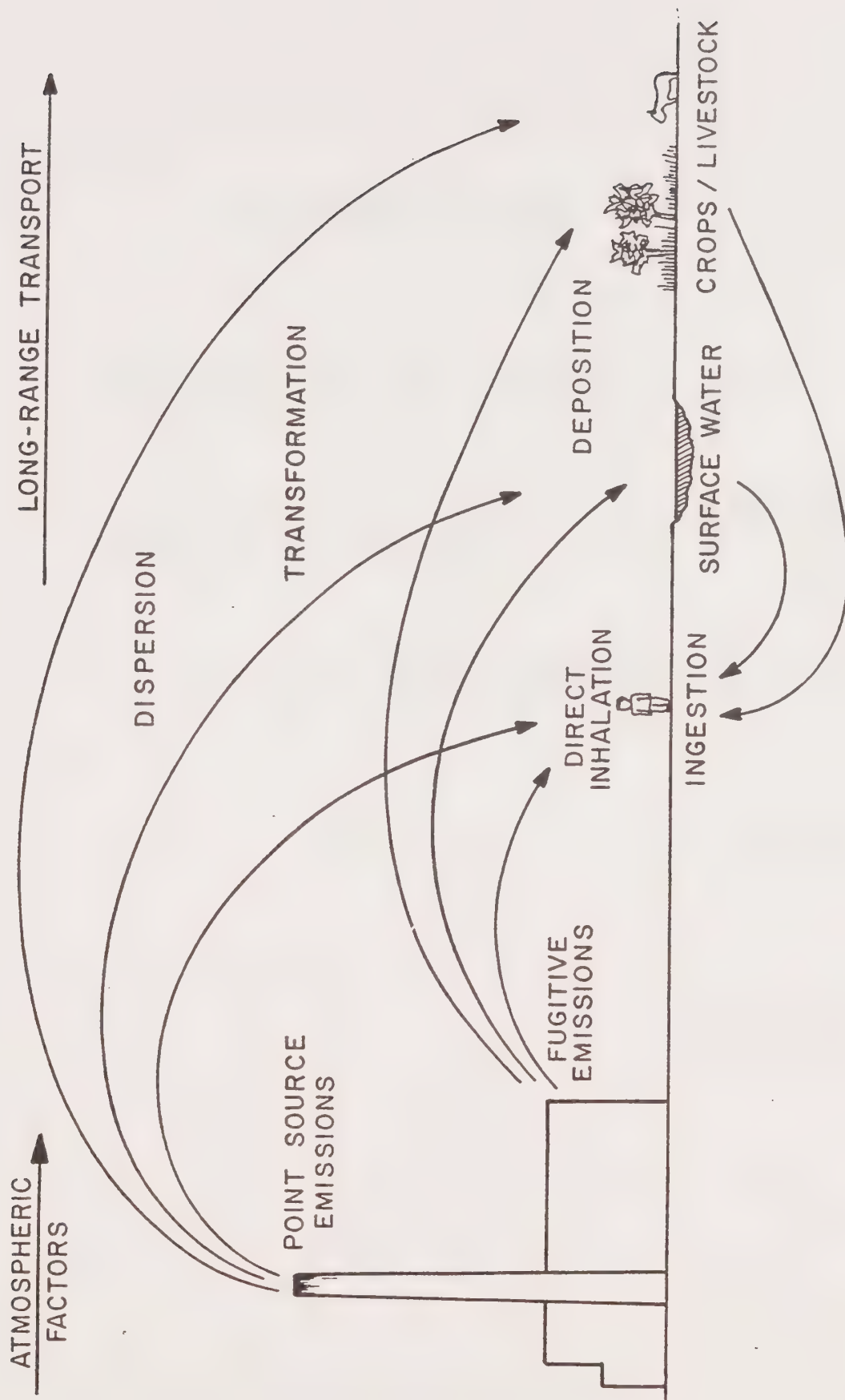
REGIONAL, INTERMEDIATE AND LOCAL FLOW SYSTEMS



HYDROLOGIC CYCLE



ATMOSPHERIC PATHWAYS



RECEPTORS

- HUMANS**
- ALL LIVING BEINGS**
- LAND**
- WATER**
- AIR**

**REMEMBER WHEN YOU
COULD THROW OIL ON
TROUBLED WATERS?**

A SPILL IS A DISCHARGE OF A POLLUTANT

- INTO THE NATURAL ENVIRONMENT
- FROM OR OUT OF A STRUCTURE, VEHICLE OR OTHER CONTAINER
- THAT IS ABNORMAL IN QUANTITY OR QUALITY

**IF A SPILL IS KNOWN TO ORC ON ORC PROPERTY,
ORC MUST :**

- 1. NOTIFY THE MINISTRY OF THE ENVIRONMENT AND ENERGY,
MINISTRY OF CONSUMER AND COMMERCIAL RELATIONS, THE
MUNICIPALITY IN WHICH THE SPILL OCCURRED AND THE OWNER
OR CONTROLLER (EG. CLIENT OR TENANT) OF THE CONTAMINANT**

The Ministry (MOEE) may be notified through the local Ministry office or the Spills Action Centre at 1-800-268-6060.

- 2. CLEANUP THE SPILL AND RESTORE THE
ENVIRONMENT**

Spills and/or leaks from storage tanks can be cleaned up by local contractors with:

- (1) capability to obtain and handle samples appropriately,
- (2) access to analytic labs,
- (3) ability to evaluate test results,
- (4) equipment to clean up,
- (5) ability to write a brief letter report documenting the successfully completed clean up.

- 3. COMPENSATE THOSE WHO SUFFERED A LOSS AS A RESULT OF
THE SPILL.**

THE PHASE I ENVIRONMENTAL SITE ASSESSMENT

WHAT IS IT!

**The Systematic Process by Which an
Assessor Seeks to Determine Whether a
Particular Property is or may be subject
to actual or potential Contamination.**

The Phase I Environmental Site Assessment (ESA) is now described in a Canada wide Standard Known as CSA Z768-94*

The Term "Environmental Audit" Should Not Be Used to Describe a Phase I ESA. An Environmental Audit is "a Systematic Process of Objectively Obtaining and Evaluating Evidence Regarding a Verifiable Assertion About an Environmental Matter to Ascertain the Degree of Correspondence Between the Assertion and Established Criteria, and then communicating the results to a client.**

***DESCRIPTION OF A PHASE 1 ENVIRONMENTAL SITE ASSESSMENT IS AVAILABLE FOR TENDERING ORC WORK - CALL W. WILSON (416) 585-6755, SEE ALSO SECTION 5.**

****CSA STANDARD Z 751-94**

WHY BUDGET TO ASSESS CONTAMINANTS?

A Phase I Environmental Site Assessment Is Intended to Give ORC Management Confidence that any Contaminant Liabilities Associated with ORC Undertakings On ORC Real Property Are:

- (1) Identified
- (2) Evaluated And, If Necessary,
- (3) Resolved in Plan of Action according to Provincial Standards.

HOW ENVIRONMENTAL SITE ASSESSMENTS DEAL WITH ISSUES

- **POINTS OUT POTENTIAL ISSUES OF COMPLIANCE WITH SPECIFIC REGULATIONS, STANDARDS, POLICIES AND GUIDELINES**
- **IDENTIFIES RISKS OF NON-COMPLIANCE**
- **IDENTIFIES POTENTIALLY HAZARDOUS CONDITIONS FOR WHICH STANDARDS MAY NOT EXIST**
- **RECOMMENDS A COURSE OF ACTION FOR RESOLUTION OF POTENTIAL AND ACTUAL ISSUES**

TO REPEAT:

**WHAT TRIGGERS A PHASE I
ENVIRONMENTAL SITE ASSESSMENT
(Phase I ESA)?**

- **USE OF CLASS EA CHECKLIST OR ORC
CONTAMINANT CHECKLIST WHERE SITE-SPECIFIC
INVESTIGATIONS REVEAL:**
 - (A) **ANY OUTSTANDING QUESTION OF THE
NATURE OR EXTENT OF SUSPECTED
CONTAMINATION ON THE REAL PROPERTY**
 - (B) **ANY QUESTION ABOUT THE PAST USE OF
SUSPECTED HAZARDOUS SUBSTANCES ON THE
REAL PROPERTY**
- **SUSPICION OF ACROSS-BOUNDARY MIGRATION OF
CONTAMINANTS**
- **SITES INVOLVING HOUSING OR CMHC FUNDING
AUTOMATICALLY REQUIRE PHASE I ESA**
- **NEED FOR BASELINE INFORMATION IN CERTAIN
TENANT SITUATIONS**

PHASE I ESAs

**WILL HAVE ESCALATING LEVEL OF
SOPHISTICATION DEPENDING ON NATURE OF
LAND USE OF SUBJECT PROPERTY:**

AGRICULTURE

Pesticides

RESIDENTIAL

Underground Storage Tanks

OFFICE BUILDING

Asbestos

PCB

Ventilation System and Indoor Air Quality

COMMERCIAL

Underground Storage Tanks

Inappropriate Waste Practices

Past Use of The Site For Storage of Hazardous
Substances

INDUSTRIAL

Full Range of Potential Issues

*What is a Phase I Environmental Site Assessment? - Description on
following pages.*

ONTARIO REALTY CORPORATION

PHASE I ENVIRONMENTAL SITE ASSESSMENT

**(A DESCRIPTION OF THE MINIMUM LEVEL OF WORK
REQUIRED BY THE ONTARIO REALTY CORPORATION FOR
AN INITIAL CONTAMINANT INVESTIGATION)**

For additional copies of this Document, contact:

Wm M C Wilson, MCIP, CES

**Phone: 585-6755, Fax 585-4263 (or 585-7577)
Environmental Coordinator
Ontario Realty Corporation**

TO: ONTARIO REALTY CORPORATION (ORC) STAFF

RE: Description of Minimum Level of Work Required By ORC For An Initial Contaminant Investigation, Commonly Known As A "Phase I Environmental Site Assessment" (Phase I ESA).

1. Introduction

This description is intended to outline the procedures which ORC agents should request for initial contaminant investigations of real property. These Phase I ESAs are usually requested by ORC agents when the Class Environmental Assessment Category "B" checklist process raises some question about the chemical state of a given piece of real property. The Canadian Standards Association (CSA) Standard Z768-94, published in April 1994, has been used as basis for this description.

This description is intended for internal ORC staff use in (a) understanding what a Phase I ESA does and does not do and (b) designing Requests for Proposals for initial contaminant studies of individual ORC properties.

In the interests of objectivity and obtaining specialized expertise, Phase I ESAs are normally done by private consultants.

2. Purpose of Phase I ESA

The purpose of a Phase I ESA is to identify actual and potential site contamination. This involves the evaluation and reporting of existing information collected through Records Review, Site Visit and Interviews. Phase I ESAs may assist in reducing uncertainty about potential environmental liabilities and may be a basis for further investigation of the property. Phase I ESAs may be used to make informed decisions about property transactions, identify certain baseline environmental conditions, assist in meeting regulatory requirements, and as an initial step in site remediation.

3. Level of Assessment Detail-AN MBS CALL !

This description constitutes a minimum level of assessment that is required for performance of a Phase I ESA. ORC agents may wish to obtain either an enhanced level of assessment (eg the requirement for borehole sampling and analysis or other intrusive testing to obtain more detailed knowledge of known areas of contamination) or a lesser level (eg site investigation only). Such variations from this standard description should be made clear in ORC Requests for Proposals. The appropriate level of assessment will be guided by factors such as:

- (a) *the types of activities that have occurred on the property and neighbouring properties;*
- (b) *the framework of legislation and published guidelines that apply to the property;*
- (c) *the materials used at the property;*
- (d) *the types of processes and operations at the property;*
- (e) *the amount of information available concerning environmental compliance at the property; and*
- (f) *ORC's need for additional information.*

The specific level of assessment, which will be basically decided by ORC at the Request For Proposal stage, should be recorded as the Terms of Reference in the Assessor's final Phase I ESA report.

The level of assessment may need to be expanded or otherwise revised during the performance of a Phase I ESA if the information gathered suggests a higher likelihood of contamination present than originally thought or the possible presence of contaminants other than those originally anticipated. (ORC agents may cite a contingency dollar amount for such unforeseen circumstances, as a percentage of the overall fee bid for extra work, provided it is done at the Request For Proposal stage to all bidders and not at a later date in the execution of the work.)

ORC needs to balance the costs of a Phase I ESA against the time and level of effort required to gather additional information and reduce uncertainties about site conditions. There is a point at which the cost of information obtained or the time required to gather it outweighs the usefulness of the information and/or the timeliness of completing the Phase I ESA.

4. Components of a Phase I ESA

The four principal components of a Phase I ESA shall be as follows:

- (a) *a Records Review;*
- (b) *a Site Visit;*
- (c) *Interviews; and*
- (d) *Evaluation of information and reporting.*

5 Records Review - General

5.1 Intent

The Records Review shall be designed to collect data on past activities on the site that could be interpreted as contributing to existing contamination. The Records Review should be the first activity in a Phase I ESA and, as a result, should provide ORC with:

- (a) *an in-depth understanding of the site history;*
- (b) *knowledge of a range of possibilities with respect to contamination; and*
- (c) *documentable facts with respect to actual contamination.*

5.2 Documentation of Sources

The Phase I ESA report shall document each source of information that was examined in the Records Review, even if a source revealed nil findings or no response was received. Documentation of sources shall be sufficient to enable reconstruction of the research either at a later date or by another party.

5.3 Timeframe

Information should be reviewed back to the first property use which may have affected the site's environmental condition (eg., prior to development) or to the extent that historical information allows.

5.4 Search Distances

Since neighbouring properties may affect, or be affected by, the property being assessed, appropriate search distances shall be determined and documented. As a minimum, adjacent properties shall require a review of reasonably ascertainable records described in sections 6.1, 6.2, 6.3 and publically available records described in section 6.7.

The following factors shall be considered in determining search distances:

- (a) current and historical land use on the subject property and on neighbouring properties;*
- (b) known or suspected contamination on the subject property and on neighbouring properties; and*
- (c) where appropriate, proposed future use of the property, rezoning applications or official plans for development.*

6. Mandatory Records Review

6.1 Aerial Photographs

Aerial photographs may be useful for evaluating historic land usage and showing general site usage, structures and improvements, tank farms, pits and sumps, poor drainage areas, access to the property, adjacent land use and areas of disturbed soil.

Aerial photographs may be available at universities, public libraries, or from companies that maintain collections of large scale photogrammetric projects. Aerial photographs are routinely taken by the federal and provincial/territorial agencies.

6.2 Property Use Records

Sources of property use information may provide insight into the potential presence of contamination. Property use information includes:

- (a) insurance records (eg., fire insurance maps) and;*
- (b) property use directories (eg., industrial or city directories).*

6.3 Title Search and Assessment Rolls

Title searches and assessment rolls from other sources shall be reviewed. When unavailable, a title or assessment roll search shall be performed. Title searches provide information on the chronology of ownership. Assessment rolls specify the current owner of the property and adjoining properties.

6.4 Previous Phase I ESA Reports

Previous Phase I ESAs may include information that other parties may subsequently want to use to avoid undertaking duplicative assessment procedures. Assessors shall use some or all of the information in prior Phase I ESAs if, in the opinion of the Assessor:

- (a) the information to be used was generated using procedures which meet or exceed the requirements of this description; and*
- (b) the conditions at the property likely to affect the contamination have not changed substantially since the prior Phase I ESA was conducted.*

The Assessor shall consider the amount of time that has passed since the prior Phase I ESA report was prepared as well as:

- (a) the types of activities that occur at the property;*
- (b) conditions in the areas surrounding the property; and*
- (c) changes in environmental legislation.*

Evaluating the reasonableness or thoroughness of a prior Phase I ESA should take into account the circumstances under which the assessment was performed and the date when it was prepared.

6.5 Company Records

For commercial and industrial properties, company records shall be examined. Useful documents include:

- (a) site plans;*
- (b) building plans;*
- (c) permit records*
- (d) production and maintenance records (eg process control diagrams);*
- (e) asbestos surveys;*
- (f) site utility drawings;*
- (g) emergency response or contingency plans;*
- (h) spill reporting plans and records;*
- (i) inventories of chemicals and their usage (ie., WHMIS);*
- (j) material safety data sheets;*
- (k) environmental monitoring data;*
- (l) waste management records;*
- (m) inventory of underground and above-ground storage tanks; and*
- (n) environmental audit reports*

6.6 Geological and Geotechnical Reports

Existing geological and geotechnical reports containing information that pertains to the environmental condition of the subject property shall be obtained and reviewed.

6.7 Regulatory Information

The appropriate regulatory agencies (eg., provincial or federal environmental agencies, local municipalities) shall be contacted to obtain information regarding:

- (a) permits (eg., certificates of approval, storage tank registrations, plant operating permits) that pertain to activities which may impact the environmental condition of the property (eg., hazardous waste storage, treatment and disposal or other potential sources of contamination);*
- (b) past, pending, outstanding or continuing prosecutions, work orders or control orders or complaints related to environmental compliance; and*
- (c) violations of environmental statutes, regulations, by-laws, approvals and permits.*

7. Optional Records Review

7.1 Geologic and Soil Maps

Maps are available from federal, provincial and territorial agencies responsible for mineral/natural resources and/or the environment. The availability, scale and quality of these maps varies between jurisdictions.

Bedrock geology maps contain information regarding geologic units and features such as lithology, faults, folds and formational contacts. Surficial geology maps contain information about the type and extent of unconsolidated material. Hydrogeological maps can provide information about groundwater flow patterns, aquifer yields, and groundwater chemistry.

Soil maps provide information on soil types. Soil type is important in predicting leachability of contaminants, acidity, and other factors influencing migration of contamination.

7.2 Topographic Maps

Topographic maps are available from various agencies (more often agencies with responsibility for control of surface water and sewage collection). These maps are available at various scales. Comparing maps from previous eras with present maps may assist to identify areas of fill on a site.

7.3 Agreement of Purchase and Sale

When an Agreement of Purchase and Sale exists, it should be reviewed for information on vendor warranties or special conditions concerning contamination.

7.4 Land Use Documents

Environmental Constraint maps and Official Plans may identify known or potentially contaminated lands. Municipal land use or engineering departments may be contacted for information regarding rezoning, subdivision, building and demolition permits for the property.

7.5 Public Health Concerns

Municipal or Regional health departments may be contacted for information regarding public health concerns associated with contamination on the property, surrounding properties, or in the community in general. Public Health Officers are frequently responsible for the inspection, permitting and review of water distribution and sewage disposal systems.

7.6 Utility Company Records

Utility companies may be contacted to verify the presence of utility distribution facilities.

7.7 Local Information Sources

Municipal archives, public libraries, and other information sources may be consulted for historical information about a site. Information that may be available includes photographs, maps and newspaper clippings.

7.8 Helpful Information

Sources of information which may assist in the Records Review include, but are not limited to:

- (a) environmental audit reports;*
- (b) public health notices regarding hazardous materials on the property or surrounding area;*
- (c) well logs or water well databases;*
- (d) inventories of waste disposal sites;*
- (e) inventories of PCB waste storage sites;*
- (f) inventories of coal gasification plants;*
- (g) inventories of underground and aboveground storage tanks;*
- (h) air, surface water and groundwater quality data; and*
- (i) waste generator registries.*
- (j) environmental constraint mapping and lists of former landfill sites.*

8. Site Visit

8.1 Timing

The Site Visit should be conducted after completion of the Records Review. This enables the Assessor to target specific areas of the property for investigation. For example, areas of disturbed soil revealed in an aerial photograph should be visually inspected for evidence of contamination.

8.2 Methodology

The Assessor shall directly observe the subject property and shall record the method used to make the observations and any limiting conditions on the observations. It may be necessary to observe adjoining properties from the boundaries of the subject property or from publically accessible areas.

8.3 Property Use

The Assessor shall directly observe current uses or evidence of past uses of the property that involve, or have involved, such activities as the use, treatment, storage, disposal or generation of hazardous materials, landfilling, or the storage of wastewater in impoundments. The Assessor should also consider, the extent possible, current or past uses of the adjoining and surrounding property.

8.4 Hazardous Materials

An inventory of hazardous materials shall be prepared that records approximate quantities of material, types of containers and storage conditions.

8.5 Unidentified Substances

When unidentified substances are observed on the property, the approximate quantities involved, types of containers, and storage conditions shall be identified and described.

8.6 Storage Tanks

The approximate age, size, and, where possible, contents of each storage tank, as well as the location of abandoned or previously removed tanks, shall be identified. Aboveground and underground storage tanks, vent pipes, fill pipes or access ways indicating underground storage tanks shall be identified and described.

8.7 Storage Containers

The presence, condition and, where possible, contents of storage containers shall be identified and described.

8.8 Odours

Strong, pungent or noxious odours, and their possible sources, shall be identified and described.

8.9 Potable Water Supply

Sources of potable water for the property shall be identified and described.

8.10 Special Attention Substances

The Assessor shall identify the likely presence of certain substances/conditions such as:

- (a) Polychlorinated Biphenyls (PCBs);*
- (b) Asbestos-containing materials (ACMs);*
- (c) Ozone-depleting substances (ODSs);*
- (d) Lead;*
- (e) Radon gas;*
- (f) Urea formaldehyde foam insulation (UFFI);*
- (g) radioactive substances;*
- (h) noise;*
- (i) electromagnetic frequencies; and*
- (j) vibration.*

9. Site Visit - Interior Observations - General

The interior of structures on the property shall be inspected for indications of contamination. It may be necessary to look under floors, above ceilings, or behind walls.

9.1 Heating and Cooling

Heating and cooling systems shall be identified and described in terms of the energy (fuel source) and the methods used to release or dispose of waste products (eg., combustion gases, ash);

9.2 Stains

Stains on floors, walls or ceilings shall be identified and described. Where practical, the areal extent of the staining shall be identified and the likely spill source shall be described. The presence of cracks, proximity to floor drains and catch basins, or any other opportunities for contaminants to migrate away from a source shall be described.

9.3 Drains and Sumps

The Assessor shall note the location and condition of floor drains and sumps which show any evidence of contamination.

9.4 Electrical Systems

Elaborate electrical systems may be a clue with respect to otherwise unnoted manufacturing processes.

10. Site Visit - Exterior Observations - General

The exterior structures on the property shall be inspected for indications of contamination. This shall include an inspection of the exterior surfaces of structures (eg. roof) as well as an examination of the grounds.

10.1 Observation of Adjoining Properties

The grounds of the adjoining properties and associated structures shall be observed from the subject property and from publicly accessible vantage points.

10.2 Topographic, Geologic and Hydrogeologic Conditions

The topographic conditions of the property and surrounding area shall be observed and noted. Where exposure of the subsurface exists (eg., trenches, pits, ponds), the Assessor shall observe and describe, in general terms, the geologic and hydrogeologic conditions.

10.3 General Description of Structures

The Assessor shall observe and generally describe the structures or other improvements on the property. This includes describing the number of buildings as well as their estimated age, number of storeys, and location.

10.4 Wells

Water wells which are in current use or have been used in the past, and the water therein, shall be identified and described. Oil, gas or disposal etc. wells will be identified and described.

10.5 Sewage Disposal

The method of sewage disposal shall be identified and described. This includes indications of sewage systems, including septic systems or cesspools, on the property.

10.6 Pits and Lagoons

Man-made pits and lagoons on the property and on adjoining properties shall be identified and described, particularly if they have been used in connection with waste disposal or waste treatment.

10.7 Stained Materials

Stained materials (eg., soil, asphalt) shall be identified and described.

10.8 Stressed Vegetation

The locations and extent of stressed vegetation shall be identified and described.

10.9 Fill

Areas that appear to have been filled or graded by non-natural causes (or filled with material of unknown origin) shall be identified and described.

10.10 Wastewater

Wastewater or other liquid discharge, other than stormwater into a ditch or stream on or adjacent to the property, shall be identified and described.

10.11 Watercourses, Ditches or Standing Water

Surface water features (eg., ditches, streams, rivers, ponds, lakes) on the property shall be identified and described. This should include stormwater and run-off which may drain on or adjacent to the property.

10.12 Roads, Parking Facilities, and Right-of-Way

Public thoroughfares crossing or bordering the property should be identified. This includes any roads, streets, parking facilities or rights-of-way.

11. Interviews - General

The purpose of the Interviews is to corroborate or augment the information gathered in the Records Review and Site Visit. Interviews can also serve to prepare for a site visit.

11.1 Content

The questions to be asked in Interviews pertain to current and past activities and events that may affect environmental conditions at the subject property. The questions should pertain to the applicable items detailed in the Records Review and Site Visit.

11.2 Methodology

Questions may be asked in person, by telephone or in writing, at the discretion of the Assessor. The Assessor should determine whether or not to ask questions before, during, or after the Site Visit.

The Interviews may be deemed complete if the questions have been asked (or attempted to be asked) in person or by telephone and written records have been kept by the Assessor of the person to whom the questions were addressed and their responses.

12. Who Should be Interviewed

12.1 Site Representative (Owner and/or ORC Agent)

An ideal site representative is one who has lived and/or worked on the site for a number of years. The Assessor shall attempt to arrange a mutually convenient appointment for the Interview, preferably, in connection with the Site Visit.

12.2 Occupants

The Assessor shall make reasonable attempts to interview a representative number of occupants of the property, either by interviewing such occupants when making the Site Visit or by calling such occupants by telephone.

12.3 Government Officials

The Assessor shall document the reasons for having chosen particular agencies. A reasonable attempt shall be made to interview at least one knowledgeable staff member of any one or more of the following types of local government agencies:

- (a) local Fire Department serving the property;*
- (b) local Public Health Agency serving the area in which the property is located;*
- (c) local agency or regional office of federal, provincial, territorial or municipal agency having jurisdiction over waste management, works department and engineering in the area in which the property is located; and*
- (d) local agency having jurisdiction over environmental matters.*

12.4 Interviews Conducted for Prior Phase I ESAs

Information obtained from previous Phase I ESA Interviews may be used as information in conducting interviews for current Phase I ESAs. The Assessor shall question persons previously interviewed about any new information learned since the time the prior Phase I ESA was conducted.

13. Evaluation of Information and Reporting

13.1 Evaluation of Information

The Assessor shall evaluate the findings obtained in the Records Review, Site Visit, and Interviews and present such information in a manner designed to help the ORC understand the significance of the findings. To do this, the Assessor shall:

- (a) *distinguish fact from opinion;*
- (b) *clearly identify areas of actual or potential contamination and the basis for all findings; and*
- (c) *indicate the relative degree of uncertainty associated with evidence of potential contamination.*
- (d) *outline implications and significance of findings with respect to current Ontario regulations, guidelines, policies and legislation.*

13.2 Report Format

The Phase I ESA Report shall follow a format similar to the following:

TABLE OF CONTENTS

- 1. EXECUTIVE SUMMARY**
- 2. INTRODUCTION**
 - Need for Work, Personnel Involved and Methodology*
- 3. SITE DESCRIPTION**
 - Visit Dates, Findings and Summary*
- 4. RECORDS REVIEW**
 - Findings and Summary*
- 5. INTERVIEWS**
 - Findings and Summary*
- 6. EVALUATION OF FINDINGS OF CONTAMINATION**
- 7. CONCLUSIONS WITH REGARD TO CONTAMINATION**
- 8. RECOMMENDATIONS (FOR PHASE II, IF NECESSARY)**
- 9. APPENDICES**
 - Terms of Reference, Graphics, Data, Assessor Qualifications, References, all supporting documentation.*

13.3 Findings

All findings, including nil findings, shall be included in the report. The report shall state the dates to which all of the findings relate.

13.4 Conclusions

The report shall have a Conclusions section that states that the Phase I ESA has revealed:

- (a) no evidence of contamination in connection with the property.*
- (b) evidence of potential contamination in connection with the property (list and describe);*
- (c) evidence of actual contamination in connection with the property (list and describe); or*
- (d) evidence of actual and potential contamination in connection with the property (list and describe).*

The conclusions shall be supported by findings, including nil findings, which are sufficiently documented to facilitate reconstruction of the findings and conclusions, either at a later date or by a third party.

13.5 Recommendations for Action

Where actual or potential contamination exists, the Assessor shall describe methods and actions to reduce the level of uncertainty (eg., confirm, refute, or delineate the contamination). The Assessor shall provide the rationale for proposing such actions and estimate costs of those actions. Recommended actions may only entail minor housekeeping actions by a regular site maintenance program (eg. clean up and disposal of empty drums from premises). Other actions may necessitate commissioning consultants and specialized contractors for Phase II and III ESAs.

13.6 Names of Assessor Participants

The report shall name the key Assessor participants involved in performing the four principal components of the Phase I ESA.

13.7 Signatures and Qualifications

The Assessor responsible for the Phase I ESA shall provide original signatures confirming the performance of the Phase I ESA and its findings and conclusions contained therein. A statement of qualifications of the Assessor responsible for the Phase I ESA shall be included in the report.

13.8 References and Supporting Documentation

The report shall provide documentation, including references and key exhibits, to support the findings and conclusions contained in the report. Applicable federal, provincial/territorial, and local legislation and published guidelines used as a basis for findings or conclusions in a Phase I ESA shall be referenced in the ESA report.

14. Definitions

The following definitions apply in this Description:

Adjoining properties: *any properties which are contiguous or immediately adjacent to the property being assessed.*

Assessor: *a person or business entity who carries out a Phase I ESA according to the requirements of this Description.*

Contamination: *the presence in soil, water, groundwater, air, or structures of a material or condition that may adversely affect human health or the natural environment (eg., soil, water, land, buildings). Contamination criteria shall be established in consultation with the appropriate regulatory authorities.*

Environmental audit: *a systematic process of objectively obtaining and evaluating evidence regarding a verifiable assertion about an environmental matter, to ascertain the degree of correspondence between the assertion and the established standards and criteria, and then communicating the results to the Client.*

Hazardous material: *a material which may, upon exposure, constitute an identifiable risk to human health or the natural environment. Hazardous material criteria are established in consultation with the appropriate regulatory authorities.*

Phase I Environmental Site Assessment (ESA): *the systematic process, described above, by which an Assessor seeks to determine whether a particular property is or may be subject to actual or potential contamination. A Phase I ESA does not involve the intrusive procedures of sampling, analyzing, and measuring unless enhancements are agreed upon between the Assessor and ORC. The term environmental audit should not be used to describe a Phase I ESA. An environmental audit may include the review of previously performed Environmental Audits.*

Phase II Environmental Site Assessment: Field Sampling and Analysis.
The purpose of a Phase II ESA is usually to confirm and delineate, or to demonstrate the absence of, contamination on a property identified through the Phase I ESA procedure. In some cases, a Phase II ESA may be undertaken to establish a quantitative baseline for environmental conditions at a site. Phase II investigations are undertaken prior to remedial investigation (see below).

It is not essential that a Phase I ESA be completed prior to conducting a Phase II ESA. In some instances, sufficient information exists regarding potential contamination to proceed directly to a Phase II ESA.

Field sampling and analysis programs must be developed on a site-specific basis in consultation between ORC and the Assessor supervising the Phase II study. The sampling and analysis program may include elements such as the following:

- (a) soil drilling and/or test pitting;
- (b) soil geophysical analysis;
- (c) soil vapour probe installation;
- (d) surface water sampling;
- (e) ground water sampling;
- (f) indoor air sampling;
- (g) outdoor air sampling;
- (h) sampling of local fauna and/or flora;
- (i) analysis of (a) - (h) for organic chemicals, inorganic chemicals, minerals, and radioactivity; and
- (j) analysis of (h) for adverse health effects, in individuals or populations.

A Phase II ESA may in itself proceed in phases. Phase II ESAs may commence with screening surveys and coarse sample spacing. More detailed sampling is frequently necessary to delineate areas of contamination or define parameters essential for impact/risk assessment or Remedial Investigation.

Differences Between Phase I and Phase II Environmental Site Assessments.

The key technical feature that distinguishes Phase I and Phase II investigations is the use of quantitative sampling and analytical techniques in Phase II studies. However, other important non-technical differences also exist. Depending on the scope of issues to be dealt with, a Phase II investigation may be much more expensive and time consuming than a Phase I ESA. Furthermore, Phase II assessments usually require contributions from specialized environmental professionals. Unlike Phase I assessments conducted in conformance with this Description, the scope, duration, and cost of a Phase II investigation are highly dependant upon factors such as: the weather, the methods used, the size of the site, the number, type, and identity of suspected contaminants, the level of confidence desired in analytical results, and the environmental matrices (eg., air, surface water, ground water, soil, plants, animals) to be sampled.

Property: land and any improvements to land, consisting of any physical object attached to the land with some degree of permanence. The terms "property" and "site" are used interchangeable in this description.

Remedial Investigation (usually called for as part of a Phase II ESA)

A remedial investigation should be performed whenever a Phase II assessment (or, rarely, a Phase I ESA) reveals contamination which is:

- (a) in contravention of Ontario guidelines, standards or regulations;
- (b) considered dangerous to human health, immediately or in the long-term; or
- (c) deemed unacceptable by the ORC for any other reason.

Purposes of a remedial investigation are to:

- (a) identify several feasible approaches to remedy the contamination, including the "do nothing" approach;*
- (b) critically compare these approaches by considering factors such as risks to workers and the surrounding population, and economic and technical feasibility;*
- (c) determine the extent of remedial measures required;*
- (d) allow remediation costs to be estimated; and*
- (e) to select criteria against which the success of the remedial measures can be evaluated.*

Note: "Remedial Investigation" is sometimes referred to as the third phase of an environmental site assessment (ie., "Phase III ESA")

Differences Between Phase II ESA and Remedial Investigation

Phase II ESAs and Remedial Investigations differ primarily in their purpose. Whereas Phase II studies are undertaken to confirm or refute the presence of contamination, Remedial Investigation studies are undertaken to consider remedial options and develop a preferred remedy for unacceptable levels of contamination. While Phase II studies involve field sampling and analysis, Remedial Investigations involve more interpretive procedures, and usually have a limited field component. Because science, engineering, public policy, social, economic and legal issues may directly affect the conclusions arising from a Remedial Investigation, professionals with expertise in all of these areas may be required.

Remedial Investigation Program Components

Remedial investigation programs must be developed on a site-specific basis in consultation between ORC and the professional supervising the Phase II study. The program may include elements such as:

- (a) assessment of storage, removal, disposal, and treatment options for contaminated materials;*
- (b) quantitative risk assessment for single contaminants and contaminant mixtures;*
- (c) human and/or environmental exposure estimation;*
- (d) computer modelling of environmental fate and transport processes;*
- (e) socio-economic impact analysis of remedial options;*
- (f) review of rationale for relevant environmental guidelines, standards and regulations; and*
- (g) development of site-specific criteria to ensure protection of human health and the environment, and to allow evaluation of the success of the remedial measures.*

CONCLUSION

Any questions with regard to this description, or in connection with compiling an ORC Request for Proposal from this description, can be directed to the undersigned.

A handwritten signature in cursive script, appearing to read 'W.M.C. Wilson', written in dark ink.

W.M.C. Wilson

Environmental Coordinator

Ontario Realty Corporation

Phone: 1-416-585-6755

Fax: 1-416-585-4263 or 585-7577

**ADMINISTERING THE
PHASE I
ENVIRONMENTAL SITE ASSESSMENT
(Ph I ESA)
PROCESS**

**In the Interest of Objectivity and
Technical Accuracy, ORC Ph I
ESAs
are Usually Done by
Private Consultants**

ADMINISTERING THE PHASE I ESA

DETERMINE NEED

- Personal Site Observations and Use of the ORC Class EA Checklist Questions for Contaminants Should Trigger ESA Phase I

APPROACH TO "SCOPE OF SERVICES" MAY DEPEND ON:

- Terms of Sale of Purchase
 - Vacant Possession?
 - Operating Equipment to Stay?
 - Obligation for Full Disclosure May Change Terms
- Types of Hazardous Materials Used/Handled
- Audience for Report Can Be Legal Staff and Upper Management or Both Parties
- When in Doubt, Refer to MOEE Clean-up Guidelines and Confer With Client (or consult with ORC Environmental Unit - W. Wilson, 416-585-6755)

ADMINISTERING THE PHASE I ESA

- **ORC USES A STANDARD REQUEST FOR PROPOSAL (RFP) FOR TENDERING ENVIRONMENTAL SITE ASSESSMENTS**

(See example on following pages)

- **ORC NOW EVALUATING ROSTER ROTATION SYSTEM FOR ROUTINE WORK.**
- **ORC HAS LIST OF CONTAMINANT CONSULTANTS**
- **SELECTION CRITERIA FOR CONSULTANTS:**
 - * Experience with similar assignments
 - * Suitability of project team
 - * Understanding of project requirements
 - * Ability to meet ORC schedule
 - * Price
- **OTHER QUALIFICATIONS INVOLVE:**
 - * Lab qualification and licences
 - * Evidence of quality control and quality assurance procedures in labs
 - * Evidence of good sample handling protocol
 - * Bonding/Insurance
 - * References
- **ORC HAS STANDARD AGREEMENT FORM (See following)**

ORC LETTERHEAD

BY COURIER

DATE

NAME AND ADDRESS OF
CANDIDATE CONSULTANT

Dear Sir:

RE: Request for Proposal (RFP)
Environmental Site Assessment Phase I,
SUBJECT PROPERTY: (LOCATION)

Ontario Realty Corporation (ORC) is pleased to invite your firm to submit a proposal, in two (2) copies, to provide professional services for an Environmental Site Assessment Phase I of the above referenced subject property. (See attached general location map)

Your proposal must reach ORC at the above address no later than the closing date of (Date) at 2:00 p.m. Review and award of contract to carry out this assignment will be (state time) after the closing date of the proposal.

The purpose of this undertaking is to determine the environmental health or liability of the subject property. The subject property is currently (state current circumstances of property). The use intended by the Province, at this time, is anticipated to be for (state intended use).

Fee Bids

Bids up to (\$xx,xxx.xx) including all costs and disbursements will be considered in this competition.

Bids in excess of (\$xx,xxx.xx) will only be considered if appropriate rational is included.

G.S.T. is not chargeable.

The proposal must be organized to separately identify and cost all the tasks of Phase I activities. As well, ORC requires that the cost of performing total Phase I services be estimated.

The proponent must submit fees for the services in a separate sealed envelope with its proposal.

Content

An environmental site assessment within the context of this proposal, should involve the following items:

(a) Records Review

- Title search of subject property ownership and adjacent properties as appropriate.
- Operational history of subject property and adjacent properties from owners and other users.
- Claims and/or orders, past and present, applicable to the subject property.
- Record of all past and present structure/facilities.
- Review of any other relevant subject property documentation.

(b) Interviews

- Record of interviews with affected persons.

(c) Subject Property Inspection

- Non-intrusive but comprehensive inspection of subject property to record existing conditions; evaluate/confirm scope of any concerns identified previously and determine if there are any additional potential contamination sources.

(d) Evaluation of Information and Reporting

- Clear, concise account of the methodology, rationale for actions taken, interpretation of analytic results, conclusions and recommendations; this reporting should make clear any requirements for Phase II work with associated costs of those Phase II investigations.

Standards

The Canadian Standards Association's (CSA) Standard "Z768-94 Phase I Environmental Site Assessment", is considered as a suitable model to tailor a work plan for these Phase I services. This Phase I standard has been incorporated by ORC into the attached document entitled "ORC Phase I ESA (Initial Contaminant Study) Description of Standard Level of Work".

Expected Results

What is expected as a result of this environmental site assessment is a clear and concise report on the environmental health or liability of the subject property. Opinions should be expressed by the successful proponent as to whether there is a low, medium or high chance of the subject property being impaired for future uses and what subsequent actions, if any, would be required to further investigate and/or remediate the situation identified, together with the estimated cost of such actions.

Contingency for Certain Phase II Services

The agreement with the successful proponent may include a contingency amount for certain appropriate Phase II services as identified in the Phase I reporting.

General

Questions with regard to the RFP should be directed to the undersigned at Phone (Phone No.) or fax (Fax No.) or to (other Provincial Agent).

Arrangements to access the buildings can be obtained during the bidding period with the (state who will be able to access subject property) at the candidate consultant's discretion.

Evaluation of proposals will be based on:

1. Understanding of the project as demonstrated by proponent's description of proposed services; 30%
2. Suitability and competence of proponent's team members; 25%
3. Ability to accommodate the time schedule; 10%
4. Previous experience in similar assignments; 20%
5. Fee; 15%

Five copies of the final report must be submitted (completion date). Your suggested schedule must allow four days for review of the preliminary draft report.

Also attached is an ORC standard agreement. The selected proponent will be expected to enter into a written and signed agreement with ORC. If there are any questions or clarification about the ORC standard agreement is needed, the proponents must raise them during the proposal period.

The proponent, if selected by ORC, must submit proof of insurance required by clause 4.9 of the standard agreement form (attached) before commencing any of the services required by the signed agreement. Such proof shall be in the form of a certified copy of the insurance policy. If the comprehensive general liability insurance policy of the selected proponent excludes pollution coverage, such policy must have the endorsement for limited pollution liability.

ORC will make available to the successful proponent any reports and documents previously undertaken in relation to the subject property.

Sincerely,

Wm. M. C. Wilson
Environmental Coordinator

Attachments

CONSULTANT SELECTION

- ***CONSULTANT OBJECTIVITY AND INDEPENDENCE IMPORTANT TO ORC***

- ***COMPETENCE OF THE CONSULTANT***
 - Combinations Of Formal Education, Knowledge, Skills And Experience

 - Knowledge And Use Of Existing Standards

 - Knowledge Of Due Diligence

- ***DUE DILIGENCE***, for ORC agents and consultants the application of standard approved procedures (eg ORC Class EA) which are:
 1. thorough in covering the issue at hand (by adhering to state-of-the-art guidelines and regulations),

 2. thoroughly documented,

 3. consistent in their application throughout ORC (as encouraged by staff training sessions), and

 4. producing verifiable results.

SKILLS OF THE CONSULTANT DOING ASSESSMENTS FOR ORC

- **SCIENTIFIC DISCIPLINES**
- **FACILITY OPERATIONS UNDERSTANDING**
- **LOGICAL WRITING AND DOCUMENTATION SKILLS**
- **BEST ASSESSMENT TECHNIQUES AND PRACTICES**
- **UNDERSTANDING ENVIRONMENTAL SYSTEMS**
- **CONSULTATION AND INTERVIEWING SKILLS**
- **KEEN OBSERVATION AND INVESTIGATIVE SKILLS**
- **LEGAL UNDERSTANDING IF HEARINGS ARE ANTICIPATED**

THIS AGREEMENT dated for reference purposes (Date).

BETWEEN:

(Consultant's name and address)

hereinafter referred to as the "Consultant"

- and -

HER MAJESTY THE QUEEN, in right of Ontario,
as represented by the Chair of the Management Board of
Cabinet

hereinafter referred to as the "Chair".

WHEREAS the Chair solicited a Proposal from the Consultant to provide professional services to (type of Services) for the subject property known as (location of Subject property) and illustrated on Schedule (#)

AND WHEREAS the Consultant submitted a Proposal on (Date) for the preparation of the services which has been accepted by the Chair,

NOW THEREFORE in consideration of the mutual provisions of this Agreement the parties hereto agree as follows:

1. SERVICES

1.1 The Consultant shall provide to the Chair the professional services in accordance with its Proposal, henceforth called the Services, attached as Schedule (#) .

1.2 The Chair shall have the right at all reasonable times to inspect and review the work being prepared by the Consultant under this Agreement.

2. COMMENCEMENT AND COMPLETION

2.1 Notwithstanding the date of this Agreement, the parties acknowledge that the actual date of commencement of the Services is (Date).

2.2 The Consultant shall undertake and complete the various phases of the Services in accordance with the timetable outlined in the Services (SECTION #). The Services shall be completed by no later than (Date).

3. FEE

- 3.1 The Chair shall pay to the Consultant its fee within 30 days of receipt of invoices. The Consultant shall submit its invoices based on completion on each task as stated in the Services.
- 3.2 The total fee payable to the Consultant for performing the Services shall not exceed (\$) inclusive of all expenses and disbursements and exclusive of Federal Goods and Services Tax ("G.S.T.").
- 3.3 The Services to be provided under this Agreement by the Consultant are solely for the benefit of the Ontario Government and therefore not subject to the G.S.T. The Consultant agrees therefore that it will not include G.S.T. in its invoices and that G.S.T. will not be payable by the Chair in respect of the fees charged for the Services.
- 3.4 The Chair has the option of requiring the Consultant to perform additional tasks not identified in the Services which may be required to complete the Services. Any such additional tasks shall only be undertaken by the Consultant on the prior written authorization of the Chair.
- 3.5 The Chair may defer payment of any invoice in the event the Chair, by notice in writing to the Consultant, disputes the amount of such invoice.
- 3.6 The Consultant shall be responsible for the payment of all sub-consultant's fees incurred by it in performing the Services.

4. GENERAL

- 4.1 Neither the Consultant nor any director, officer or member of its staff shall divulge any information of a character confidential to the affairs of the Chair or of the Province of Ontario, communicated to or acquired by them or any advice or information given or communicated by them in the course of performing the Services under this Agreement.
- 4.2 All reports, research and working papers, data, specifications and other materials and information produced under or resulting from the performance of this Agreement and the copyright therein shall be the property of the Chair and shall not be published or released without the prior written consent of the Chair.
- 4.3 The Chair may, at any time, by notice in writing to the Consultant, suspend or terminate the whole or any part of this Agreement.

- 4.4 Any written notice provided for or to be given under this Agreement, if given by the Chair to the Consultant shall be considered to be sufficiently given if either mailed by prepaid registered post or sent by facsimile transmission in accordance with the following information:

(Consultant's Prime Contact Name and address)

Facsimile:

Phone:

- 4.5 Any written notice provided for or to be given under this Agreement, if given by the Consultant to the Minister shall be considered to be sufficiently given if either mailed by prepaid post or sent by facsimile transmission to the MBS Project Manager:

(ORC Project Manager)

Facsimile:

Phone:

- 4.6 Any notice is deemed to have been given on the fifth day from the date of mailing or if given personally or by facsimile on the date of receipt.
- 4.7 Either the Chair or the Consultant may, from time to time, give notice in writing to the other of any change of address and the address therein specified shall be deemed to be the address of such party for the giving of notice thereafter.
- 4.8 The Consultant agrees that the personnel identified in (Section #) of the Services shall perform the Services. Any variance in personnel used by the Consultant shall be subject to the prior written approval of the Chair.
- 4.9 The Consultant shall at all times indemnify and save harmless the Minister, his directors, officers, employees and agents from and against all claims, by whomsoever made in any manner based upon or attributable to anything done or omitted to be done by the Consultant, its officers, employees, agents or sub-consultants in connection with the Services performed, purportedly performed or required to be performed by the Consultant under this Agreement.

- 4.10 The Consultant shall not contract work under this Agreement or assign this Agreement or any portion thereof without the consent in writing of the Chair, which consent may be arbitrarily withheld. The Chair approves the sub-consultants identified in the Consultant's Services.
- 4.11 The Consultant agrees to advise the Chair in detail of any situation that arises or appears as potentially arising which involves or could involve a conflict of interest.
- 4.12 Schedule (#) describing the Services attached hereto forms part of this Agreement.
- 4.13 This Agreement shall be construed in accordance with the laws of the Province of Ontario.

IN WITNESS WHEREOF the parties have executed this Agreement.

(CONSULTANT'S NAME)

per: _____

HER MAJESTY THE QUEEN, IN RIGHT OF
ONTARIO, AS REPRESENTED BY THE
CHAIR OF THE MANAGEMENT BOARD OF
CABINET

per: _____
/agreement

end

PHASE I

ENVIRONMENTAL SITE ASSESSMENT

GENERAL CONTENT

YOUR CHOSEN CONSULTANT IS EXPECTED TO PERFORM THE FOLLOWING:

- **RECORDS REVIEW**
- **SITE VISIT**
- **INTERVIEWS AND CONSULTATION**
- **SAMPLING AND ANALYSIS (OPTIONAL)**
- **REPORTING**

RECORDS REVIEW

- **REVIEW DATA ON PAST ACTIVITIES THAT COULD BE INTERPRETED AS CONTRIBUTING TO POSSIBLE CONTAMINATION**

- **THE KINDS OF RECORDS REQUIRED CAN INCLUDE**
 - **Records Of Past Activity On Site, The Type And Scope Of The Activity And The Length Of Time The Activity Existed**

 - **The Present/Past Location Of Any Storage Of Materials Used In The Facility, Or, The Existence Of Any Subsurface Services Provided To The Facility**

 - **Neighbouring Activities**

 - **Civil Or Criminal Actions Related To The Site**

 - **Regulatory Interest In The Site (eg. Approvals, Certificates, Forms, Permits, Actions, Work Orders Or Unresolved Environmental Issues At The Site)**

- **ALL SOURCES OF INFORMATION USED SHOULD BE DOCUMENTED, EVEN IF THERE WERE NO FINDINGS**

RECORDS REVIEW (Cont'd.)

- MAPS AND PHOTOGRAPHS

- Geology, Hydrogeology, And Soil Maps
 - * Ontario Bookstore-880 Bay
- Topographic And Municipal Maps
 - * Municipality, Renouf Bookstore - Yonge St,
- Fire Insurance Maps
 - Historical Records
 - * Local Historical Society, Library
 - Aerial Photographs
 - * John Robarts library - Tor.

- OWNERSHIP AND LAND USE RECORDS

- GOVERNMENT RECORDS

ENVIRONMENTAL SITE ASSESSMENT

HELPFUL DOCUMENTS

- Prior Site Assessment Reports
- Environmental Audit Reports
- Environmental Permits
- Registration For Storage Tanks
- Material Safety Data Sheets
- Safety Plans, Preparedness/Prevention Plans
- Hydrogeology Reports Pertaining To The Property Or Surrounding Area
- Government Notices Of Violations Of Environmental Laws On The Property
- Site Utility Drawings
- Asbestos Surveys
- Well Logs Or Water Well Databases
- Waste Site Disposal Records
- PCB Waste Site Inventories
- Locations Of Known Contaminated Sites
- Piping And Drainage Systems
- Ventilation Diagrams
- Geophysical Reports
- Geotechnical Reports
- Borehole Testing Data
- Emissions Inventory Listing (eg. Air, Water And Solid Waste Streams)
- Chemical Inventory/Usage Data (WHMIS)
- Underground And Aboveground Storage Tank Identification/Drawings
- Waste Manifests
- Control Orders Or Other Directives From Regulatory Agencies
- Environmental Monitoring Data

SITE VISIT

- **IN GENERAL, THE SITE VISIT SHOULD BE CONDUCTED AFTER THE RECORDS REVIEW**
 - A thorough visual inspection of all aspects of the Subject Property as well as Adjacent Property.
- **PROPERTY USE, ESPECIALLY OVER TIME, MUST BE IDENTIFIED EITHER THROUGH OBSERVATION, RECORD REVIEW AND INTERVIEWS**
 - Must identify uses likely to have involved the use, treatment, storage, disposal or generation of hazardous materials
- **GEOLOGY, HYDROGEOLOGY AND TOPOGRAPHIC CONDITIONS IMPORTANT FOR ESTABLISHING POSSIBLE PATHWAYS OF CONTAMINANTS**
- **DETAILED REVIEW OF STRUCTURES [SURFACE AND SUBSURFACE] TO ASSESS HOUSEKEEPING PRACTICES AND SOURCES OF CONTAMINANT RELEASE.**

PHASE I

ENVIRONMENTAL SITE ASSESSMENT

SITE VISIT: BOTH BUILDINGS AND LAND

- MANY CONTAMINANT ISSUES ARE RELATED TO CHEMICAL USE, STORAGE AND DISPOSAL. AN INVENTORY OF CHEMICAL SUBSTANCES SHOULD BE DEVELOPED INCLUDING APPROXIMATE QUANTITIES AND TYPE OF CONTAINERS OF:
 - * STORAGE TANKS
 - * POOLS OF LIQUID
 - * UNIDENTIFIED SUBSTANCES
 - * STORAGE DRUMS

 - * STAINS
 - * PCBs
 - * ASBESTOS

- OTHER OBSERVATIONS MAY INCLUDE:
 - * PITS, PONDS, LAGOONS
 - * SOLID WASTE
 - * WASTEWATER
 - * WELLS
 - * STAINED MATERIAL
 - * SEWAGE DISPOSAL
 - * STRESSED VEGETATION
 - * WATER COURSES, DITCHES/STANDING WATER
 - * HEATING AND COOLING INFRASTRUCTURE
 - * DRAINS AND SUMPS

WHO'S GARDEN WAS THIS?

TOM PAXTON'S tune from the 1960s.

PRODUCTS THAT COULD CONTAIN PCBs

The major Canadian use of PCBs was in dielectric fluid for industrial electrical equipment such as electrical transformers and associated electrical equipment, electrical capacitors and electro-magnets. Other products containing PCBs include:

- waxes
- adhesives
- heat exchange fluids
- vacuum pump oils
- hydraulic fluids
- cutting oils
- carbonless copying paper
- bridge bearing lubricants
- cable insulating paper
- flameproofing
- paints
- dedusting agents
- caulking compound
- printing ink
- sealants
- plasticizers
- specialized lubricants
- fire retardants

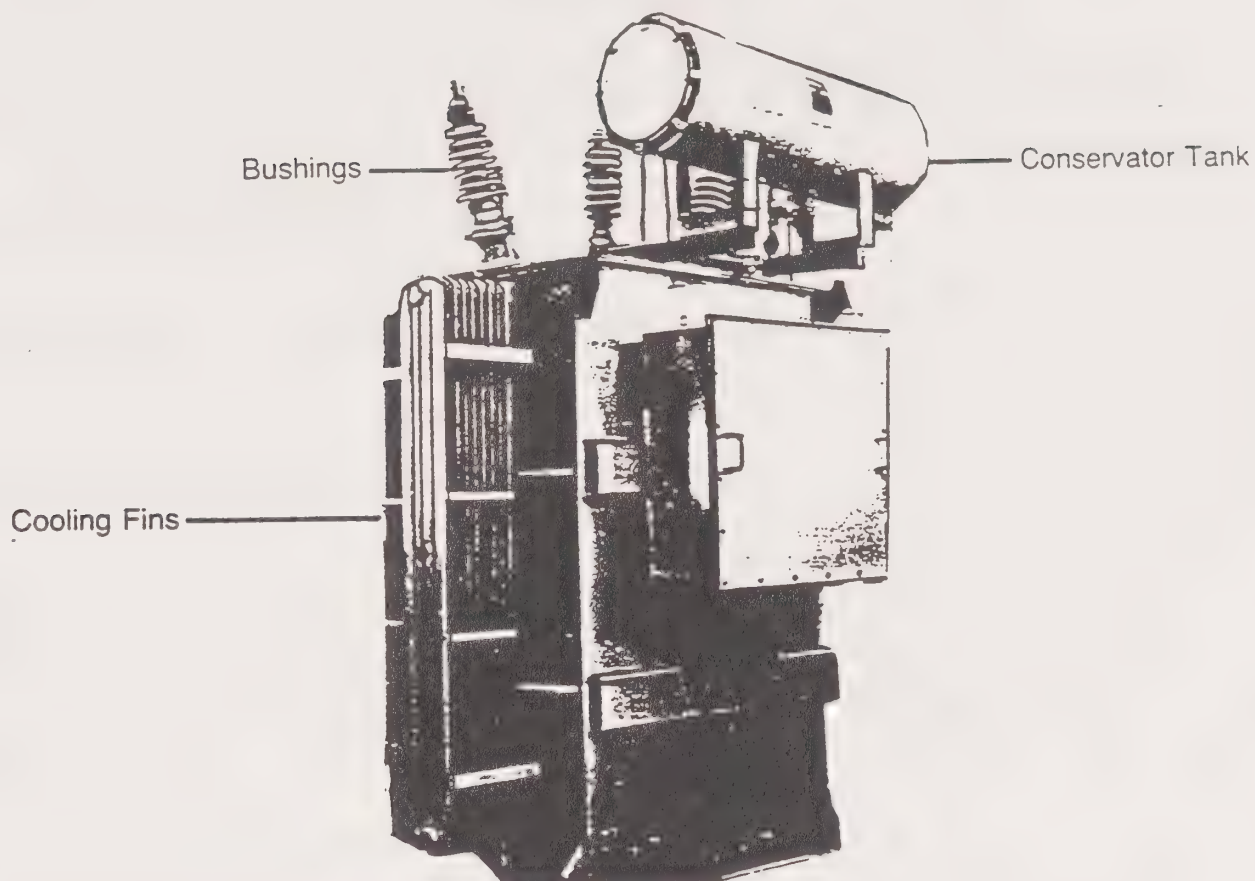
PCB fluids or PCB liquids in the form of synthetic electrical insulating material is given the generic name askarel.

Commercial mixtures combining PCBs, chlorinated benzenes and contaminants are the most common examples of askarels.

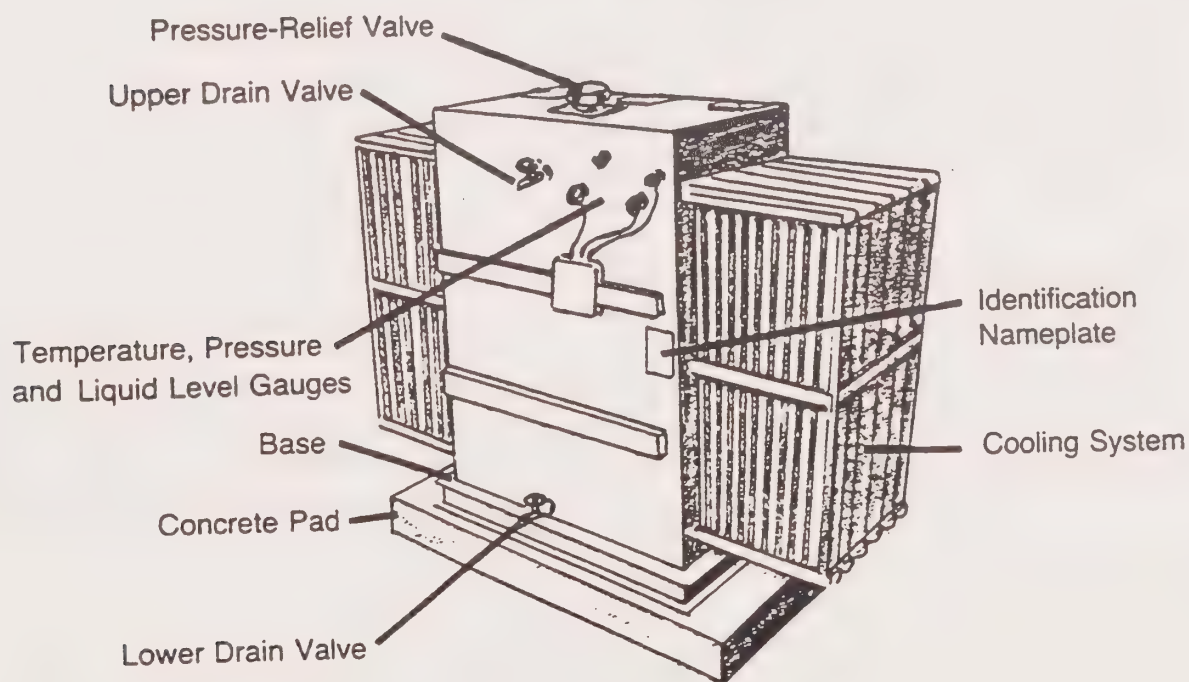
Some of the trade names under which PCB fluids (askarel mixtures) have been sold are:

- | | | |
|--------------------------------|-------------------|---------------------------|
| - Apieolio (Italy) | - Dykanol | - Pyralene (France) |
| - Aroclor | - Elemex | - Pyranol |
| US/Great Britain | | (Canada\US) |
| - Aroclor B | - Eucarel | |
| - Asbestol | - Fenclor (Italy) | - Pyroclor(Great Britain) |
| - Askarel | - Hyvol | |
| - Askarel EEC-18 | - Inclor | - Saf-t-kuhl |
| - Chlorextrol | - Inerteen | - Santotherm |
| | (Canada/US) | FR (Japan) |
| - Chlorinol | | - Kanechlor(Japan) |
| - Chlopen | - Nepolin | - Santovec 1 & 2 |
| (Germany) | | |
| - DK decachlorodiphenyl(Italy) | | - No-flamol |
| - Sovol | - Diaclor | - Phenoclor(France) |
| - Phenoclor(France) | - Therminol FR | - Pydraul (US) |

FIGURE 5.3.1.5



Conservator Tank Design Oil-Filled Transformer



Sealed Tank Design Construction

CONDUCTING A SITE SURVEY FOR PCBs

PCBs on sites will mainly be present in electrical equipment such as transformers, capacitors and fluorescent lamp ballasts. The following two publications dealing with the identification of PCBs in electrical equipment are available from Environment Canada:

- * "Handbook on PCBs in Electrical Equipment"
- * "Identification of Fluorescent Lamp Ballasts Containing PCBs"

These publications are commonly used by consultants as reference documents for PCB surveys.

PCBs AND TRANSFORMERS

There are some basic rules that consultants may use to determine whether a transformer contains PCBs. For example, not all transformers are liquid filled. Some are dry transformers. A first step is to rule out all dry type transformers, which do not have the cooling fins that are so prominent on liquid-filled transformers. Since only liquid filled transformers may contain PCBs, all dry type transformers can be eliminated from further concern.

PCBs AND CAPACITORS

Capacitors are devices designed to accumulate and hold an electric charge for power factor correction, and can be found both inside and outside industrial buildings. PCBs were used as a dielectric fluid in most capacitors manufactured between 1929 and 1978. As of July 1980, PCBs have been prohibited from use as a constituent in any capacitor manufactured in or imported into Canada. The regulations do not specify any specific quantity or concentration of PCBs in use as a constituent of capacitors; any capacitor containing PCBs, regardless of size or use (such as in televisions, VDTs, computers, fluorescent lights etc.) cannot be imported into or manufactured in Canada.

Because of the multitude of uses of capacitors, their size, shape and appearance vary widely. Capacitors are hermetically sealed units which contain metal foil, paper, plastic film and dielectric fluid. There are no moving parts in a capacitor and there are no provisions for taking samples of the dielectric fluid unless, of course, there is some leaking or seepage of fluid. Capacitors can be found on racks or inside cabinets or mounted on wall, ceilings or floors, singly or in banks, as well as on electric motors, heat exchangers, hydraulic systems and contained within fluorescent lamp ballasts.

Capacitors are generally provided with a nameplate, which lists the name of the manufacturer, its power rating, its serial number, test number and type number and, on larger capacitors, the name of the dielectric fluid, such as askarel (see the various trade names listed above). If the capacitor is small and does not have a nameplate, estimate the length of time it has been in service; if before 1978, assume that it contains PCBs.

PCBs AND FLUORESCENT LAMP BALLASTS

Some Fluorescent lamp ballasts contain PCB capacitors. Eight domestic and foreign manufacturers of fluorescent lamp ballasts account for the largest sources of ballasts in use in Canada. Each of these companies uses a distinct code to identify the ballasts or capacitors manufactured by them. Although these codes vary from one manufacturer to the next, each code allows for the identification of the type of ballast or capacitor, its dielectric fluid and, most importantly, its date of manufacture. Generally, any ballast containing a capacitor manufactured after 1977 is marked as "NON PCB".

OTHER SOURCES TO LOOK FOR

PCBs may be present in any oily liquid on site. Particular attention should be paid to oil storage tanks, drums of unknown liquid waste and stained soil or building materials below transformers. The presence of PCBs can be easily determined by collecting representative bulk sample of the material of concern and having it analyzed at a qualified laboratory.

INTERVIEWS

(CONSULTATION WITH DIRECTLY
AFFECTED PUBLIC)

- INTERVIEWS ARE IMPORTANT FOR
COMPLETE DEVELOPMENT OF SITE
HISTORY
 - Sometimes The Only Verification Of
Historical Data And Specific Positioning
Of Certain Activities
- THOSE TO BE INTERVIEWED CAN
INCLUDE
 - * SITE REPRESENTATIVE
 - * MAINTENANCE
 - * PROPERTY MANAGER
 - * NEIGHBOURS
 - * PHYSICAL PLANT SUPER
 - * OLDER RETIRED EMPLOYEES
 - * GOVERNMENT OFFICIALS

PRELIMINARY SAMPLING (OPTIONAL IN PHASE I)

- **PURPOSE OF SAMPLING IS TO CONFIRM AND DELINEATE, OR TO DEMONSTRATE THE ABSENCE OF, CONTAMINATION**
- **SAMPLING MAY BE CHOSEN TO ESTABLISH A QUANTITATIVE BASELINE FOR ENVIRONMENTAL CONDITIONS (IE. COMMERCIAL RENTAL PROPERTIES)**
- **DEPENDENT ON SCOPE OF ISSUE, SAMPLING CREATES MORE COST IN \$ AND TIME**
 - Could Require Special Equipment
 - Requires Separate Visit
 - Some Sampling Can Be Done During Initial Site Visit If Determined As Part Of The Scope
- **FIELD SAMPLING AND ANALYSIS PROGRAMS DEVELOPED ON SITE-SPECIFIC BASIS**
 - Hazardous Materials Sampling (ie. Asbestos)
 - Mystery Materials
 - Surface Soil Samples
 - Samples In Trenches, Sumps
 - Standing And/Or Well Water
 - Test Pit Digging
 - Subsurface Drilling
- **HAND AUGERS AND/OR SHOVELS OFTEN USED IN PHASE I**

REPORTING

RECOMMENDATIONS COULD INVOLVE.....

- IMMEDIATE LIABILITY MITIGATION
- FACTORS THAT MAY BE USED IN THE NEGOTIATION PROCESS
- INFORMATION FOR BUDGET PLANNING

WITH MORE ACCURATE KNOWLEDGE OF ENVIRONMENTAL LIABILITIES, AN ORC AGENT CAN NOW APPROACH THE NEGOTIATION PROCESS USING GOOD BUSINESS PRINCIPLES

THE PHASE I ESA REPORT

- DEMAND LOGIC, CLARITY AND CLEAR LANGUAGE IN CONSULTANT'S REPORT
- FINAL REPORTS MUST BE CLEAR AND CONCISE FOR MANAGEMENT ACTION WHILE STILL SUPPORTING THE CONCLUSIONS WITH GOOD TECHNICAL DATA
 - * CONCISE EXECUTIVE SUMMARY
 - * SUPPORTABLE CONCLUSIONS AND RECOMMENDATIONS
- REPORT SHOULD INCLUDE PRIORITIES:
 - * IMMEDIATE MANAGEMENT ACTIONS RELATING TO EVIDENT COMPLIANCE VIOLATIONS
 - * OTHER "DUE DILIGENCE" ACTIONS RELEVANT TO PROPOSED UNDERTAKING

THE PHASE I ESA REPORT

SUGGESTED FORMAT

- **EXECUTIVE SUMMARY**
One page of major findings and recommendations
- **INTRODUCTION**

| | |
|--------------|--|
| WHO | conducted the assessment |
| WHERE | was the assessment conducted |
| WHEN | was the assessment conducted |
| WHY | was the assessment conducted |
| WHAT | was the scope of the assessment (the terms of reference may have been modified during course of the work) |
- **HISTORY OF THE SITE**
Past owners and uses
Past uses of nearby properties
Potential for contamination due to prior operations on the
site or from neighbouring land used
- **ASSESSMENT FINDINGS AND CONCLUSIONS**
Presence of potentially harmful substances
Presence of on-site contamination
Affected regulations concerns (compliance)
Significance of findings with respect to regulations,
guidelines
- **RECOMMENDATIONS**
What actions must ORC take by law?
(First order of magnitude cost implication are desirable
here if Phase II work is required)
What actions should ORC take for Due Diligence?
What actions should ORC take for good mgt practice?

UPON RECEIPT OF THE PHASE I ENVIRONMENTAL SITE ASSESSMENT

- **DO YOU HAVE CONFIDENCE IN THE RESULTS?**
 - Does Report Clearly Document Results Of The Investigation And Supporting Evidence?
 - Are The Conclusions and Recommendations Supportable?
- **DO FINDINGS SHOW EVIDENCE OF CONTAMINATION?**
- **HAS CONSULTANT USED PROFESSIONAL JUDGEMENT?**
 - Numerous Situations Not Completely Controlled By Regulations
 - What Compliance Problems are Noted, if Any?
- **RECOMMENDATIONS MUST BE PRACTICAL AND COST EFFECTIVE**
 - Not All Assessments Have To Move To The Next Phase
 - If Phase II is Recommended, Does Phase I Report Specify Clear Actions of Sampling and Analysis, With Associated Costs?

PHASE I IS DONE....NOW WHAT DO YOU DO?

PHASE II ESA

"SITE SAMPLING AND ANALYSIS"

INCLUDES

- **FIELD SAMPLING - (MAY INCLUDE SOIL, SURFACE WATER, SEDIMENT, AIR AND GROUND WATER)**
- **LAB ANALYSIS**
- **INTERPRETATION OF SIGNIFICANCE OF LAB RESULTS AND ALL FINDINGS, I.E. ARE THERE EXCEEDANCES OF GENERAL CRITERIA?**
- **IS A CLEAN-UP, OF ANY KIND, RECOMMENDED?**
- **PUBLIC CONSULTATION CONSIDERED IF FINDINGS SHOW CLEAN-UP IS REQUIRED**
- **REPORTING ON ALL ABOVE**

PHASE II

FIELD SAMPLING PROGRAM WILL:

- DELINEATE THE FULL EXTENT OF BOUNDARIES OF CONTAMINATION ALREADY DISCOVERED OR SUSPECTED**
- DEFINE SITE PHYSICAL, SUBSURFACE AND ATMOSPHERIC CONDITIONS TO ASSESS VARIOUS CONTAMINANT PATHWAYS**
- DEFINE AREAS OF UNKNOWN SUBSURFACE ANOMALIES**
- IDENTIFY AREAS WHICH WERE NOT ACCESSIBLE DURING PHASE I INVESTIGATIONS**
- ENABLE CONSULTANTS TO ASSESS FEASIBILITY OF VARIOUS CLEAN-UP OPTIONS**

***PHASE II FIELD SAMPLING, ANALYSIS AND INTERPRETATION WILL
GENERALLY COST MUCH MORE THAN PHASE I WORK***

FIELD SAMPLING STRATEGIES, PROCEDURES AND TECHNIQUES

- **BOUNDARIES OF CONTAMINATED AREA**

- Define Boundaries (Area Extent and Depth) To Permit Volume Calculations
- Analyze Any Samples Preserved From Phase I (Consultant Splits And Keeps Half Of Samples)
- Analyze Samples In Stages To Define A "Clean-Line". Additional Samples Collected, During The Phase I Program May Reduce Field Work

- **GROUNDWATER**

- Drilling Boreholes For Vertical Contamination in Stratigraphy And Aquifer Zones
- Piezometers Or Stand Pipes Can Be Installed In Boreholes Or Test Pits
- Establish Areal Extent of Contamination With A Series Of Piezometers (Small Diameter Monitoring Wells) , One Located Upgradient From Problem Areas And The Remainder Situated Downgradient From Problem Areas And At Suitable Depths For The Expected Contaminants
- Establish A Gradient Or Direction Of Groundwater Flow Using A Minimum Of Three Piezometers In Triangle Formation

- **BURIED OBJECTS**

- Scan The Area With Geophysical Devices (Magnetometer, Earth Conductivity Survey Or Ground Penetrating Radar) To Locate Buried Drums, Underground Storage Tanks, Unknown Buried Materials, Utility Corridors And To Outline Groundwater Contamination Depending On Contaminant Characterization And Materials Composition

- **SAMPLE HANDLING PROTOCOLS**

- **SOIL AND OVERBURDEN**

- Concentrate Sampling Density In Area Suspected To Be Contaminated From A Review Of Phase I Data
- Establish A Sampling Grid eg. - 3m Grid (Spacing Is Site-Specific) Over The Suspected Contaminated Area And The Adjacent Areas
- At Each Sampling Location Collect A Surficial Sample (0 To 10 cm) As Well As Deeper Samples (Site-Specific) Sufficient To Characterize The Extent Of Contamination In The Unsaturated And Saturated Zone
- Auger Boreholes By Hand And Collect Samples At Approximate Depths
- Excavate Test Pits With A Backhoe And Collect Samples Off Walls And Bottom

- Auger Holes By A Mobile Drill Rig And Collect Samples At Appropriate Depths. A Sampler Should Be Employed To obtain "Undisturbed" Samples
- Analyze A "Sufficient" Number
- Archive Extras
- **SURFACE WATER**
 - Collect Water Samples From Ditches, Drains, Ponds, Seepage, Springs, Lagoons, Creeks, Rivers, Sewers And Outfalls Etc.
- **SOIL AND VOLATILE VAPOURS**
 - Vapour Measurement Can Be Made With Air Monitoring Equipment To Provide Immediate Feed Back On Contamination
 - Sometimes It Is Used To Direct Clean-up
- **SLUDGES AND RESIDUES**
 - Conduct Characterization, If Required, To Determine Materials That Are Hazardous And To Define Disposal Requirements (Such As, Leaching Tests, Dewatering, Ignition Pointy, Corrosiveness)
 - Collect Sludges And Residues From All Drains, Sumps, Gutters, Process Vessels, Treatment Facilities And Ponds And Lagoons
- **SEDIMENTS (DITCHES, PONDS, LAGOONS)**
 - Sample Sediments In Topographic Depressions On The Property That May Have Received Site Drainage
 - Sample Sediments In Drainage Ditches, Drains, Catchbasins, Sumps And Dry Wells That May Have Been Contaminated By Carried Process Wastewaters
 - Sample Sediment Particularly In Areas Where Water Tends To Pond, Or Where Frequent Spills Or Discharges Have Occurred
- **BACKGROUND SAMPLES (ONLY IF NECESSARY)**
 - Background Locations Should Be At Least 1000m Upgradient From The Site With Respect To The Prevailing Wind Direction, Groundwater And Surface Water Flow
 - Design Background Sampling Program For All Sample Types Of Interest
 - Select Sufficient Number To Provide Statistical Confidence where "sufficient" can be defined
 - Background Sites Should Have The Same Geologic Origin As The Plant Site
 - Obtain Approval From Landowner(s) To Access The Background Sites

SAMPLING EQUIPMENT DISCUSSED

BURIED STRUCTURES

- * ELECTROMAGNETIC SCAN

AIR MONITORING

- * GASTEC
- * PHOTOVAC
- * AMBIENT MONITORING (DUST FALL, HI-VOL)
- * I.H. MONITORING TOOLS

WATER MONITORING

- * GRAB SAMPLES
- * COMPOSITE SAMPLER WITH AUTOMATED EQUIPMENT

SOIL MONITORING

- * BACKHOE
- * HAND AUGER
- * DRILL TRUCK
- * SPLIT SPOON SAMPLER

GROUNDWATER MONITORING

- * PIEZOMETERS
- * BALERS
- * AUTOMATIC PUMPING

SENSING METHODS TO LOCATE UNDERGROUND STORAGE TANKS

Underground storage tanks (UST) whose exact locations are unknown or uncertain may be located by geophysical techniques. The most common techniques used to locate metallic USTs are electromagnetic (EM), magnetic (Mag), metal detection (MD) or ground penetrating radar (GPR). EM, GPR and most forms of MD are active systems measuring responses to generated signals, whereas Mag is a passive method which measure changes in natural conditions. If the UST is nonmetallic, e.g. fibreglass then only GPR will have a chance of locating it.

EM measures subsurface electrical conductivities by alterations to an instrument generated EM signal. A commonly used instrument, the Geonics EM-31 has a switch which can set the receiver mode to measure signals induced by ferrous metallic objects. The system has the added benefit of being able to detect many types of subsurface contaminant plumes by switching to ground conductivity measurement mode. Mag measures distortion in the earth's natural magnetic field caused by ferrous metals such as iron and steel. The success of the Mag survey is largely dependent on target orientation. Gradient Mag surveys are done by measuring differences in magnetics at two different heights at a measurement station. Gradient surveys usually reduce the amount of variation that would normally occur in a single signal total field measurement. MD surveys respond to the electrical conductivity of metal targets, both ferrous metal and non-ferrous metal objects such as copper, lead and brass. MD is used mostly by utility companies to locate subsurface pipes. GPR is a reflection technique using high frequency radio waves which are bounced off subsurface features. A GPR system generally has a number of different frequency antenna which can be selected for improved signal response. Its performance is highly site specific and influenced greatly by properties of soil and rock materials. Generally better results are obtained in dry, sandy or rocky areas.

All the above methods use instruments that can be operated by one person, although some systems are more portable and manoeuvrable than others. The depth of signal response ranges from a few meters to between six and eight metres under good site conditions. However most MD systems are only effective within a few metres below ground surface.

The larger UST the greater the chance of detecting at depth. All units are capable of continuous operation and with the exception of Mag provide some indication as the depth of the target in the ground. Mag surveys require the operator to be free of metal objects. The cost of operating the equipment are generally similar for EM, Mag and MD. GPR is usually the most expensive.

To perform a survey, the general search area must be known in order to select the most appropriate geophysical method and avoid spurious signals (noise) or other interfering

effects. Objects which cause most interference with the EM, Mag and MD methods are surface metallic objects such as automobiles, fences, overhead powerlines and metal objects lying on the ground surface and even building walls. The noise generated by these objects can completely mask the signal response from a UST. At sites where there is no information regarding the location of the UST a survey is done by establishing a field grid and recording signal responses at predetermined intervals.

The survey results are usually plotted on a map and the anomalies show as contours. GPR results are plotted as strip profiles similar to ocean floor depth sounding. An experienced operator is usually able to delineate the boundaries of subsurface anomalies at the time of the field survey.

All four methods described above can be done by most individuals with some training, however the hiring of an experienced operator will speed the survey time and likely increase the reliability of the results. Geophysical techniques alone do not always provide unique solutions to locating UST. All investigations where the location of the target is unknown should make use of other information which might be available in archives or from persons having a detailed knowledge of the investigation area.

CONDUCTING A BUILDING SURVEY FOR RADON

Radon is a tasteless, odourless, invisible gas. It cannot be detected with our natural senses. Several low cost passive devices are available which, after a period of exposure can be mailed to a laboratory for analysis.

If the presence of radioactive building materials or surface contaminations by a radioactive source is suspected, a survey should be done using portable contamination meter equipment with a beta-gamma probe and an alpha-beta probe. This instrumentation costs approximately \$5,000. Gamma, alpha and beta are the main radiation types of concern with gamma being the most hazardous.

The decision whether or not to do a field survey for radiation is a judgement call by the investigator based on site conditions and history. However, in view of the low costs involved in conducting a radiation survey and the hazardous nature of the contaminant it would be a very prudent exercise particularly if the site is a former plant or medical facility.

UNDERGROUND STORAGE TANK (UST) REMOVAL

The removal of a UST should be done by a licensed contractor familiar with the regulatory aspect of the work including the regulations of the Occupational Health and Safety Act. Prior to starting any excavation, arrangements should be made to have an MOEE licensed waste hauler pump any remaining hydrocarbon products from the UST for disposal off-site in

an environmentally acceptable manner. The discovering of a large quantity of water in the UST is usually a sign that leaks are present in the system. A tank pressure test can determine the integrity of the system.

If upon excavation it is discovered that the UST has leaked its contents into the surrounding soil and/or groundwater MCCR and MOEE agents should be notified immediately and a site visit arranged so that their suggestions for contaminant remediation can be obtained. On-site evaluation of the soils surrounding the UST by olfactory senses are sufficiently acute to detect even low levels of hydrocarbons. Additionally total organic vapour (TOV) detectors can be used to quantify hydrocarbon levels in both the parts per million (PPM) and % lower explosive (LEL) range.

In the event that the UST has leaked and contaminated the surrounding environment the contamination must be remediated. The evaluation of the extent of soil and groundwater contamination is usually determined by implementing an environmental soil and groundwater sampling and testing program, usually by a qualified consultant. Samples of soil, groundwater, and soil vapour are analyzed to determine how far the hydrocarbon has spread. Regulatory cleanup criteria are formulated on a site specific basis depending on levels of environmentally adverse exposure impacts.

Soils remediation usually means excavation and disposal in a landfill licensed to accept the material. Prior to disposal in a landfill, the contaminated material must be tested using the method outlined in Ontario Regulation 347 to determine its waste classification. The amount of contaminated soils that will require excavation is determined by establishing a cleanline where soils are not visibly stained, have no hydrocarbon odour, and generally measure below 200 ppm on a TOV detector. Soils must also meet the oil and grease criteria listed in the Guidelines for the Decommissioning and Cleanup of Sites in Ontario (MOE Waste Management Branch, February 1989). Soils remaining on the site should meet the MOEE

"INTERIM GUIDELINE FOR THE ASSESSMENT AND MANAGEMENT OF PETROLEUM CONTAMINATED SITES IN ONTARIO (1993)", for benzene, toluene, ethylbenzene, xylenes (BTEX) and total petroleum hydrocarbon (TPH) levels. The remediation levels of BTEX and TPH in soils and groundwater is usually evaluated on a site specific basis in consultation with regulatory agencies.

Where there is no indications of leakage, the UST can be removed and disposed of by a certified UST recycler and the surrounding fill, together with additional clean fill, can be used to backfill the excavation.

PHASE II CLEAN-UP OPTIONS

Minor Housekeeping

- Clean-ups may take the form of minor "housekeeping" items such as:
 - Removal of stained soil patches
 - Removal of drums and/or other materials
 - Capping of unused drains or wells
- The above items may be handled within on-going ORC maintenance programs providing testing of materials and documentation is done by ORC or its agents.

Formal Phase III Clean-up

- Clean-ups may require more extensive work and testing, necessitating expert consultants to design and implement work.

SITE SPECIFIC RISK ASSESSMENT (SSRA)

Risk assessments are used for "sensitive sites" or at the owner's discretion to estimate the level of risk posed to human health or the environment from the presence of a hazard such as a chemical in soil or ground water. The process involves hazard identification, exposure determination, and the subsequent estimation of a level or risk.

A site specific risk assessment (SSRA) incorporates site specific data including site conditions and receptor characteristics in estimating whether there is an unacceptable risk to human health and the natural environment from chemicals at a property.

A site-specific risk assessment (SSBA) may be used to:

- (i) assess sensitive sites, and develop more protective clean-up criteria than the generic criteria;
- (ii) develop generic criteria when generic criteria are not provided;
- (iii) develop site specific criteria in lieu of using generic criteria;
- (iv) develop risk management/site management plan.

The document "Guidance For the Use of Risk Assessments in Site Clean-ups in Ontario" (draft May 1994) has been prepared by MOEE. It provides general guidance on a variety of topics to be considered in the development of a SSRA. Human health, ecological components, and ground water protection should be considered in SSRA.

When undertaking SSRA, literature citations should be documented, and all relevant findings, including, but not restricted to, reference doses, no effect concentrations, lowest effects concentrations, median effective concentrations and lethal effects concentrations should be reported and properly referenced. A report documenting all information relevant to the SSRA criteria development processes must be provided to the MOEE.

Environmental risk is becoming a more important aspect of credit risk. During the past year a formal environmental risk management program was implemented to promote awareness of environmental risk in all of the bank's operations, to help minimize CIBC's exposure to potential liabilities, to assist our customers in understanding their environmental risks, and to assist account and risk managers in bringing environmental issues into their lending decisions. Where appropriate environmental audits are required to help mitigate this risk.

- Canadian Imperial Bank of Commerce
1993 Annual Report

PHASE III

CLEAN-UP

OFF-SITE OPTIONS

- **EXCAVATION AND DISPOSAL ("DIG AND DUMP")**
 - * Contaminated Soil Is Excavated And Sent To An Approved Disposal Facility

IN-SITU OPTIONS

SOIL

- **SOIL VENTING**
 - * Removal Of Hydrocarbon Vapours From Unsaturated Soil
- **SOIL FLUSHING**
 - * Removal Of Contaminants From Soil By Water, Water Plus An Additive Or By A Solvent

GROUNDWATER

- **PUMP AND TREAT/CONTAINMENT**
 - * Free Product Recovery/Separation
 - Pumping Wells Or Trenches
 - Pumping And Skimming Or Oil/Water Separator
 - * Air Stripping
 - For Removal Of Volatile Organics From Groundwater
 - * Carbon Adsorption
 - For Removal Of Low Concentration Of Dissolved Organics From Groundwater
 - * Air Sparging
 - Air Is Injected Directly Into Saturated Zone
 - Effective For Volatiles (BTEX)
 - * Enhanced Oxidation
 - Use Ultraviolet Light In Combination With Ozone Or Hydrogen Peroxide

GROUNDWATER AND SOIL

- **BIOREMEDIATION**
 - * Process By Which Organic Contaminants Are Destroyed By The Action Of Soil Bacteria

ABATEMENT OF LEAD CONTAMINATED BUILDING MATERIALS

Lead contaminated building materials (i.e. bricks) can be abated by encapsulation of the lead (i.e. plastic coatings, drywall) or by scarification of the lead contaminated layer using techniques such as sandblasting, grinding or power washing. When scarification is used, careful consideration must be given to occupational hazards and disposal requirements.

ABATEMENT OF LEAD CONTAMINATED SOILS

Lead is generally not very mobile in the environment and tends to remain relatively close to its point of initial deposition. Soils strongly retain lead in their upper few centimetres. Metallic lead and its insoluble/precipitated compounds are heavier than water and tend to settle out. There are only some lead compounds that are slightly soluble in water.

The six primary options available for dealing with lead contaminated soils are:

1. no action
2. off-site disposal
3. containment
4. immobilization
5. separation with resource recovery
6. separation without resource recovery

No action may be possible if there is not a high risk of migration due to the proximity of human and environmental receptors or if the lead levels are below government guidelines for the planned land use.

Excavation and removal of contaminated soil is a popular remedy for smaller sites but due to disposal costs may not be the best choice where widespread contamination is present.

Containment may be acceptable in conditions that could promote mobility of lead (i.e. porous soil, acid conditions) are present. Consideration would have to be given to the site's reduced land value and limited future land use, for example, as a parking lot.

Immobilization options for lead contaminated soil involve either solidification/stabilization or vitrification, in situ or ex situ. Solidification involves mixing the soil with cement/lime while stabilization involves mixing the soil with fly ash or blast furnace slag. Vitrification converts contaminated soil into chemically inert, stable glass and crystalline materials by a thermal treatment process.

The separation options for lead contaminated soils are soil washing and acid leaching. However, both tend to be relatively novel, complex and costly. Soil washing in a water-based process for mechanically scrubbing soil ex situ to remove undesirable contaminants. Acid leaching removes lead from soils by first converting the lead to a soluble salt, leaching the soluble salt with an appropriate acidic solution, and then removing the lead salt from solution via precipitation or electrowinning.

RADON GAS ABATEMENT

Elevated radon gas levels in buildings caused by ground conditions can be reduced by sealing floors and walls. In cases where this is not practical, a sub-floor can be built over the existing floor and the space between the floors ventilated outside the building. This method proved to be particularly effective in reducing radon levels in homes located in the Elliot Lake and Bancroft areas of Ontario.

Covering walls with plastic materials such as polyamide, polyvinylchloride, polyethulene or epoxy paint, or giving them three coats of oil-based paints, reduces the emission of radon from this source tenfold. Even wallpaper may have the effect of reducing levels by 30%.

METHANE GAS ABATEMENT

Methane gas may be remediated by either removing the source (eg naturally occurring peat or deposited organic, wood wastes) or by building in a venting system. Either solution can be very expensive.

SALT REMEDIATION

Salt contamination in groundwater has been commonly found in MTO patrol yards as a result of storage of road salt. Remediation methods are usually costly but may be necessary where migration into neighbouring lands is detected. "Dig and Dump" methods may yet be most cost effective if quantities are not large. Otherwise some containment may be necessary. Remediation technology is being researched by M.T.O.

PHASE III

DEVELOPMENT OF CLEAN-UP CRITERIA MAY BE NECESSARY

- CRITERIA MAY NOT EXIST FOR SOME SUBSTANCES, EG. SODIUM IN SOIL
- USUALLY DEVELOPED USING
 - Past Experience Which Is Analogous And/Or
 - Application Of A Risk Assessment
- BOTH ARE COMPLEX PROCESSES
- IF CRITERIA NOT DIRECTLY APPLICABLE (EG HIGH AMBIENT LEVELS) OR ECONOMIC, THEN SITE SPECIFIC CRITERIA CAN BE DEVELOPED IN DISCUSSION WITH APPLICABLE REGULATORY AGENCY
- MAJOR FACTORS THAT SHOULD BE CONSIDERED WHEN DEVELOPING SITE CLEAN-UP CRITERIA INCLUDE
 - Environmental And Human Health Toxicology
 - Background Or Ambient Levels Of The Contaminant(s)
 - The Amount And Type(s) Of Contaminated Material(s)
 - Mobility Of The Contaminants
 - Migration Pathways To Points Of Human Or Environmental Impact
 - The Combined Or Synergistic Effects Of Contaminants
 - Phytotoxicolgy (Plant Stress) Of The Contaminant(s)
 - Planned Future Land Use And Adjacent Land Uses
 - Contaminant Migration Control Mechanisms
 - Aesthetics (Appearance, Odour)
 - Available Treatment Technologies
 - Cost
- FINALLY, VERIFICATION TESTS OF CLEAN CONDITION.

PHASE III

FALSTAFF AND KEELE IN NORTH YORK

TECHNICAL SPECIFICATIONS TENDERED FOR Clean-up AND DEMOLITION:

ASBESTOS ABATEMENT TYPE I, II, III

PCB WASTE

UNDERGROUND STORAGE TANK REMOVAL

HAZARDOUS MATERIALS

REFRIGERANTS

SILICA

LEAD

MERCURY

FIRE DETECTORS

| | | | |
|---|--|---|--|
| A CONSIGNOR (GENERATOR) EXPEDITEUR (PRODUCTEUR) | | Provincial ID No. - N° d'id. provincial | |
| Company Name - Nom de l'entreprise | | Provincial ID No. - N° d'id. provincial | |

| | | | | |
|---|--|--------------|-------|---------------------------|
| Mailing Address - Adresse postale | | City - Ville | Prov. | Postal Code - Code postal |
| Shipping Site Address - Origine de l'expédition | | City - Ville | Prov. | Postal Code - Code postal |

| | | | |
|---|--|---|---------------------------|
| City - Ville | | Prov. | Postal Code - Code postal |
| Intended Consignee - Destinataire prévu | | Provincial ID No. - N° d'id. provincial | |

| | | | | |
|--|--|--------------|-------|---------------------------|
| Address - Adresse | | City - Ville | Prov. | Postal Code - Code postal |
| Receiving Site Address - Destination de l'expédition | | City - Ville | Prov. | Postal Code - Code postal |

| | | | |
|--------------------|--|---|---------------------------|
| City - Ville | | Prov. | Postal Code - Code postal |
| Vehicle - Vehicule | | Registration No. - N° d'immatriculation | Prov. |

| | | | |
|--|--|--|--|
| Trailer/Rail Car No 1 - 1 ^{re} remorque - wagon | | | |
| Trailer/Rail Car No 2 - 2 ^e remorque - wagon | | | |

| | | |
|----------------|--|---------------|
| Point of Entry | | Point of Exit |
| Point of Entry | | Point of Exit |

| | | | |
|---|--|---|--|
| Carrier Certification: I declare that I have received wastes as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. | | Declaration du transporteur: J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets. | |
| Yr. An Mon. Mois Day. Jour | | Name of authorized person (print) Nom de l'agent autorisé (caractères d'imprimerie) | |

| | | | |
|--------------|--|---|---------------------------|
| City - Ville | | Prov. | Postal Code - Code postal |
| Signature | | Tel. No (Area Code) - N° de tel (ind. reg.) | |

| | | | |
|--------------------------------|--|--|--|
| Waste Identification | | Identification du déchet | |
| Physical State - Etat physique | | Shipping Name of Waste - Appellation réglementaire du déchet | |

| | | | |
|---|--|-------------------------|--|
| N° Provincial No. (Quebec - Ontario only) / (Québec - Ontario seul) | | TOC/APPIN / LTM/DNIP | |
| Quantity Shipped - Quantité expédiée | | Units - L or kg / ou kg | |

| | | | |
|----------------|--|------------------------------------|--|
| Classification | | Packing Group - Groupe d'emballage | |
| No. - N° | | Codes - Codes | |

| | | | |
|---|--|-------------------------------------|--|
| Quantity Received - Quantité reçue | | Units - L or kg / ou kg | |
| Identify Any Shipment Discrepancy Problems - Attach Addendum if Necessary - Indiquer toute différence relative à l'expédition. Joindre une feuille au besoin. | | Handling Code - Code de manutention | |

| | | | |
|----------------------------------|--|---------------------|--|
| Decomamination - Décontamination | | Vehicule - Véhicule | |
| Yr. An Mon. Mois Day. Jour | | Time - Heure | |

| | | | |
|------------------------------------|--|---|--|
| B CARRIER (TRANSPORTER) | | Provincial ID No. - N° d'id. provincial | |
| Company Name - Nom de l'entreprise | | Provincial ID No. - N° d'id. provincial | |

| | | | | |
|-------------------|--|--------------|---------------------------|---------------------------|
| Address - Adresse | | City - Ville | Prov. | Postal Code - Code postal |
| City - Ville | | Prov. | Postal Code - Code postal | |

| | | |
|---|--|---------------|
| Registration No. - N° d'immatriculation | | Prov. |
| Point of Entry | | Point of Exit |

| | | | |
|---|--|---|--|
| Carrier Certification: I declare that I have received wastes as offered by the consignor in Part A for delivery to the intended consignee and that the information contained in Part B is complete and correct. | | Declaration du transporteur: J'atteste avoir reçu les déchets offerts par l'expéditeur dans la partie A en vue de leur livraison au destinataire choisi et que les renseignements inscrits à la partie B sont exacts et complets. | |
| Yr. An Mon. Mois Day. Jour | | Name of authorized person (print) Nom de l'agent autorisé (caractères d'imprimerie) | |

| | | | |
|--------------|--|---|---------------------------|
| City - Ville | | Prov. | Postal Code - Code postal |
| Signature | | Tel. No (Area Code) - N° de tel (ind. reg.) | |

| | | | |
|--------------------------------|--|--|--|
| Waste Identification | | Identification du déchet | |
| Physical State - Etat physique | | Shipping Name of Waste - Appellation réglementaire du déchet | |

| | | | |
|---|--|-------------------------|--|
| N° Provincial No. (Quebec - Ontario only) / (Québec - Ontario seul) | | TOC/APPIN / LTM/DNIP | |
| Quantity Shipped - Quantité expédiée | | Units - L or kg / ou kg | |

| | | | |
|----------------|--|------------------------------------|--|
| Classification | | Packing Group - Groupe d'emballage | |
| No. - N° | | Codes - Codes | |

| | | | |
|---|--|-------------------------------------|--|
| Quantity Received - Quantité reçue | | Units - L or kg / ou kg | |
| Identify Any Shipment Discrepancy Problems - Attach Addendum if Necessary - Indiquer toute différence relative à l'expédition. Joindre une feuille au besoin. | | Handling Code - Code de manutention | |

| | | | |
|----------------------------------|--|---------------------|--|
| Decomamination - Décontamination | | Vehicule - Véhicule | |
| Yr. An Mon. Mois Day. Jour | | Time - Heure | |

| | | | |
|--------------|--|---|---------------------------|
| City - Ville | | Prov. | Postal Code - Code postal |
| Signature | | Tel. No (Area Code) - N° de tel (ind. reg.) | |

| | | | |
|--------------------------------|--|--|--|
| Waste Identification | | Identification du déchet | |
| Physical State - Etat physique | | Shipping Name of Waste - Appellation réglementaire du déchet | |

| | | | |
|---|--|-------------------------|--|
| N° Provincial No. (Quebec - Ontario only) / (Québec - Ontario seul) | | TOC/APPIN / LTM/DNIP | |
| Quantity Shipped - Quantité expédiée | | Units - L or kg / ou kg | |

PHASE IV ACTIVITIES

COMPLETION OF CLEAN-UP

PHASE IV INVOLVES

- **VERIFYING THAT THE SITE CLEAN-UP HAS BEEN SATISFACTORILY COMPLETED**
- **ESTABLISHING AND MAINTAINING MONITORING SYSTEMS (Only If They Are Part Of The Agreed Phase II Plan), and**
- **PROPONENT COMMUNICATES THE COMPLETION OF THE SITE CLEAN-UP TO ALL RELEVANT AGENCIES AND GROUPS AS PART OF PUBLIC CONSULTATION**
- **"NOTICE OF CLEAN-UP" MUST BE SUBMITTED TO MOEE**
- **REGISTRATION OF CERTIFICATE OF PROHIBITION ON LAND TITLE FOR ANY CLEAN-UP LESS THAN FULL (TABLE A) CRITERIA I.E.**
 - **STRATIFIED DEPTH CLEAN-UPS**
 - **CLEAN-UPS USING TABLE B CRITERIA (NON-POTABLE WATER)**
 - **SITE SPECIFIC RISK ASSESSMENT CLEAN-UPS**
 - **CLEAN-UP WHERE SITE MANAGEMENT MEASURES ARE USED**
- **MOEE ACKNOWLEDGES NOTICE AND RETURNS TO PROPERTY OWNER.**

OVERVIEW OF CLEAN-UP PROCESS

PHASE I

SITE ASSESSMENT - Phase 1 ESA

- Walk Through
- Interviews
- Historical Review

Potential Problem? -----No-----> END

Yes

PHASE II

SITE SAMPLING AND ANALYSIS - Phase II ESA

- Soil Sampling
- Ground Water Sampling
- Surface Water Sampling
- Sediment Sampling
- Air Sampling
- Data/Sensitive Site Assessment
- Public Consultation Planning

Clean-up Required? -----No-----> END

Yes

PHASE III

SITE CLEAN-UP

- Develop Clean-up Plan
- MOEE EPA/OWRA Approvals (no approval needed for Plan)
- Undertake Clean-up

PHASE IV

COMPLETION OF CLEAN-UP

- Notice of Clean-up Submitted to MOEE
- Registration of Cert. Prohibition on Land Title (Stratified/Non-Potable/SSRA only)
- MOEE Acknowledges Notice and Returns to Property Owner

CONCLUSIONS

- **Everyone Is Becoming More Aware Of Contaminants**
- **A Provincial System of Procedures and Criteria Exists**
- **For ORC Transactions, Construction And Changes In Land Use, Due Diligence With Regard To Potential Contaminants Begins With The Use Of The ORC Class EA Category "B" Checklist**
- **Understanding Contaminant Sources, Pathways And Receptors Can Reduce Uncertainty**
- **Provincial Clean-up Guidelines Do Provide ORC Agents A System To Administer An Environmental Site Assessment**
- **In The Interests Of Objectivity And Technical Accuracy, ORC Employs Private Consultants For Environmental Site Assessments**
- **Demand Clarity, Logic And Clear Language From Your Consultant**
- **Vigilance And Prevention Can Reduce The Need For Environmental Site Assessments**
- **The ORC Environmental Unit (Bill Wilson 585-6755 or Ross Farewell 585-6741) Can Assist In Administering Contaminant ESA's**

DEFINITIONS

ADVERSE EFFECT means one or more of,

- 1) impairment of the quality of the natural environment for any use that can be made of it.
- 2) injury or damage to property or to plant or animal life,
- 3) harm or material discomfort to any person,
- 4) an adverse effect on the health of any person,
- 5) impairment of the safety of any person,
- 6) rendering any property or plant or animal life unfit for human use,
- 7) loss of enjoyment of normal use of property, and
- 8) interference with the normal conduct of business;

AESTHETIC means the perception of a site as determined using the natural senses with respect to sight, sound, taste and odour.

AIR means open air not enclosed in a building, structure, machine, chimney, stack or flue.
Ambient Levels (same as Background Concentration, below)

ASSESS AND ASSESSMENT means such PHASED investigation, monitoring, surveys, testing and other information gathering activities to identify:

- 1) the existence, source, nature and extent of contamination resulting from a release into the environment of a hazardous material or chemical substance
- 2) the extent of danger to the public health, safety, welfare and the environment

The term also includes studies, services and investigations to plan, manage and direct assessment and decommissioning and cleanup actions.

BACKGROUND CONCENTRATION means the concentration of a chemical substance occurring in media removed from the influence of industrial activity at a specific site and in an area considered to be relatively unaffected by industrial activity. Background air and soil concentrations should be measured in an area of residential land use at least 1000m upgradient with respect to prevailing wind direction from the industrial site. Background concentrations in water should be measured upgradient with respect to water flow direction to the industrial site and before the water flows onto the industrial site. A sufficient number of samples should be collected to represent the statistical confidence limited required. (same as ambient levels)

CLEAN-UP means the removal of a chemical substance or hazardous material from the environment to prevent, minimize, or mitigate damage to the public health, safety, welfare or the environment that may result from the presence of the chemical substance or hazardous materials. The cleanup is carried out to attain specified cleanup criteria. Clean-up is part of PHASE III activities of the MOEE Clean-up Guidelines.

CLEANUP GUIDELINES OR CRITERIA means specified concentrations for chemical substances or hazardous materials in various environmental media (soil, ground water, surface water and air) for a specific land use that should not normally be exceeded by residual concentrations remaining after completion of cleanup. Residual concentrations exceeding the cleanup criteria will require further remedial action or on-going site monitoring. (same as numeric criteria)

CONTAIN OR CONTAINMENT means actions taken in response to the release of a chemical substance or hazardous material into the environment to prevent or minimize such release so that it does not migrate or otherwise cause or threaten substantial danger to present or future public health, safety, welfare or the environment.

CONTAMINANT means any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that may cause an adverse effect.

CONTAMINATION

CRITERIA means numerical standards that are established from concentrations of chemical parameters in various media to determine the acceptability of a site for a specific land use.

DISCHARGE when used as a verb, includes add, deposit, leak or emit and, when used as a noun, includes addition, deposit, emission or leak.

DISPOSAL SITE means any structure, well, pit, pond, lagoon, impoundment, ditch, landfill or other place or area, excluding ambient air or surface water, where a chemical substance or a hazardous material has come to be located as a result of any spilling, leading, pouring, abandoning, emitting, emptying, discharging, injecting, escaping, leaching, dumping, discarding or disposing of by any other means.

DUE DILIGENCE for ORC agents and consultants means the application of standard approved procedures (eg ORC Class EA Category B checklist) which are **thorough** in covering the issue at hand (by adhering to state-of-the-art guidelines and regulations), **consistent** in their application throughout ORC (as encouraged by staff learning sessions) and which produce **verifiable results** through documentation. (If challenged, due diligence is the sum total of documented actions taken by ORC Agents, when asked to defend themselves.)

ENVIRONMENT means

- 1) air, land or water,
- 2) Plant and animal life, including man,
- 3) the social, economic and cultural conditions that influence the life of man or a community,
- 4) any building, structure, machine or other device or thing made by man,
- 5) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of man, or
- 6) any part or combination of the foregoing and the interrelationship between any two or more of them,

ENVIRONMENTAL AUDIT

An Environmental audit is "a systematic process of objectively obtaining and evaluating evidence regarding a verifiable assertion about an environmental matter to ascertain the degree of correspondence between the assertion and established criteria, and then communicating the results to a client.

ENVIRONMENTAL SITE ASSESSMENT is an ORC initiated, phased and documented process intended to establish:

- 1) where, in a defined site, considering past and present operations therein, contaminant liabilities may exist, (Phase I ESA)
- 2) the extent and significance (environmental and financial) of any discovered liabilities, as indicated by existing Provincial regulations or other relevant criteria, and a range of clean up options (Phase II)
- 3) implemented clean up actions, if any, (Phase III) and,
- 4) verification of clean site in compliance with existing Provincial regulations, or other criteria which may have been developed in consultation with the M.O.E.E. (Phase IV) and Issuance of "Notice of Clean-up by Proponent

EXCEEDANCE is a concentration of any given parameter which is above a Provincial numeric criterium or clean up guideline.

EXPOSURE means any contact with or ingestion, inhalation, or assimilation of a chemical substance or hazardous material.

GUIDELINES means statements outlining a method, procedure, process or numerical value which, while not mandatory, should be followed unless there is a good reason not to do so.

HAZARDOUS MATERIAL means material including but not limited to, because of its quantity, concentration, chemical composition, corrosive, flammable, reactive, toxic, infections or radioactive characteristics, either separately or in combination with any substance or substances, constitutes a present or potential threat to human health, safety, welfare, or to the environment, when improperly stored, treated, transported, disposed of, used or otherwise managed.

INDUSTRIAL SITE means any land and associated buildings, structures, pipelines, disposal sites, storage areas, production areas, resource extraction areas, and shipping areas, without limitation, where an industrial activity is carried out, or was carried out and the land site not decommissioned and cleaned up prior to new land use being allowed.

LAND means surface land not enclosed in a building, land covered by water and all subsoil, or any combination or part thereof.

NATURAL ENVIRONMENT means the air, land and water, or any combination or part thereof, of the Province of Ontario.

Numeric Criteria (same as clean up guideline, above)

PATHWAY means the route along which a chemical substance or hazardous material moves in the environment.

PERSON RESPONSIBLE means the owner, or the person in occupation or having the charge, management or control of a source of contaminant.

PHASE I ENVIRONMENTAL SITE ASSESSMENT

The Systematic Process by Which an Assessor Seeks to Determine Whether a Particular Property is or may be subject to actual or potential Contamination.

PHASE II ENVIRONMENTAL SITE ASSESSMENT

A Phase II ESA is the confirmation and delineation or the demonstration of the absence of, contamination on a property identified through the Phase I ESA procedure. In some cases, a Phase II ESA may be undertaken to establish a quantitative baseline for environmental conditions at a site. Phase II investigations are undertaken prior to remedial investigation.

It is not essential that a Phase I ESA be completed prior to conducting a Phase II ESA. In some instances, sufficient information exists regarding potential contamination to proceed directly to a Phase II ESA.

Differences Between Phase I and Phase II Environmental Site Assessments The key technical feature that distinguishes Phase I and Phase II investigations is the use of quantitative sampling and analytical techniques in Phase II studies. However, other important non-technical differences also exist. Depending on the scope of issues to be dealt with, a Phase II investigation may be much more expensive and time consuming than a Phase I ESA. Furthermore, Phase II assessments usually require contributions from specialized environmental professionals. Unlike Phase I assessments conducted in conformance with this Standard, the scope, duration, and cost of a Phase II investigation are highly dependant upon factors such as: the methods used, the size of the site, the number, type and identity of suspected contaminants, the level of confidence desired in analytical results, and the environmental matrices (e.g. air, surface water, ground water, soil, plants, animals) to be sampled.

PHASE III ENVIRONMENTAL SITE ASSESSMENT

Implementation of Phase II recommendations

POLLUTANT means any contaminant other than heat, sound, vibration or radiation and includes any substance from which a pollutant is derived.

REMEDIAL ALTERNATIVE means measures or a combination of measures proposed to clean up an industrial site.

SOURCE OF CONTAMINANT means anything that discharges into the natural environment any contaminant.

WATER means surface water and ground water, or either of them.

ORC CONSULTATION AND DOCUMENTATION RECORD

NB: THIS CHECKLIST IS TO BE COMPLETED AND SIGNED BY ORC STAFF FOR ALL CATEGORY "B" PROJECTS AND MUST BE MADE AVAILABLE TO THE PUBLIC UPON REQUEST.

File/Project No: _____

Administrator/Project Manager's Name _____

PART I - PROJECT CATEGORIZATION (Ref: Class EA Section 1-7)

- 1) Determine if Client Ministry/Municipality has an applicable E.A. process and/or approval for the undertaking in question.

If YES, receive written confirmation from client that it intends to use its own process. In this case, no further EA work is required by ORC.

If NO, use ORC process, below.

- 2) Identify provisional Category of Project--i.e. A, B, C or D? (Ref: Class EA Fig.2.1, Category Listing Matrix and Appendix 1)
- 3) Verify Category (Ref: Class EA Section 8)
- 4) If Category is in doubt, use screening questions. (Ref: Class EA Table 2.1)
- 5) For Category A projects, proceed without further E.A. action unless an heritage feature of the site or building is involved. If heritage is involved, Category B (PART III, below) is required.
- 6) For Category C projects, reference Class EA Section 4.
- 7) For Category B projects, complete remainder of this Checklist.

PART II - PROJECT AND SITE DESCRIPTION

- 1) IDENTIFY CATEGORY "B" UNDERTAKING/ACTIVITY

Letting with change in land use _____
Sale, Transfer, Disposal _____
Easement _____
Purchase _____
Leasing Private Property with Change in land Use _____
Construction _____
Reconstruction _____
Addition _____
Demolition _____
Application For Change in Land Use _____
Any undertaking affecting an heritage resource _____
Decommissioning _____
Other (Specify): Ref: Class EA Fig. 2-1) _____

- 2) Client Agency, Board or Commission: _____
- 3) Site Tenant: _____
- 4) Client's Intended Use of Site : _____
- 5) SITE DESCRIPTION

Lot: _____ Con.: _____ Twp.: _____ (See SITE PLAN attached)

Site Municipal Address: _____

Site Area (hectares): _____

Existing No. and Type of Site Buildings _____

PART III - SITE ANALYSIS, CONSULTATION AND DOCUMENTATION. NB: "YES" answers require resolution in PART IV. (Ref: Class EA Sec. 4.4)

1) LAND USE STATUS, CONTACTS AND SOURCES

- a) Official Plan: _____
Contact: _____
- b) Zoning status: _____
Contact: _____
- c) Floodplain: _____
Contact: _____
- d) Prime agricultural land (class 1-4): _____
Contact: _____
- e) Specialty crop land: _____
Contact: _____
- f) Environmentally Significant Areas: _____
Contact: _____
- g) Are there surface or underground easements on the site?
Specify: _____
- h) Has the site been subject of news reports regarding its current or future use? (attach clippings, if available)
- i) From the above contacts/research, in your opinion, would intended land use conflict with current land use?: YES _____
NO _____
- j) If YES, has ORC, or anyone else, applied for a change in land use under Planning Act? Describe resolution of this issue in Part IV, below.

2) CONTAMINANTS

- a) Visual Inspection Date: _____
- b) Is there evidence on land or in buildings of any of the following:
 - ___ incineration? ___ fill added?
 - ___ leaking or unprotected underground or above-ground fuel storage tanks?
 - ___ stained surfaces? ___ vegetation damage?
 - ___ oily sheens on water? ___ discarded batteries?
 - ___ unprotected industrial drums? ___ friable (crumbling) asbestos?
 - ___ human burials? ___ ureaformaldehyde?
 - ___ PCB ballasts/transformers ___ pesticide/herbicide containers
 - ___ chlorofluorocarbons, refrigerants not in use?
 - ___ leaded paint (any building constructed prior to 1980 may contain leaded paint)?
 - ___ signs of above-noted items on adjacent properties?
 - ___ other?
(specify) _____

- c) Consult with neighbours, owners, tenants, municipal officials or Provincial officials with respect to:
 - i) Current and previous use (eg. storage, gas-vehicle repair station, printing, dry cleaners, photo lab, waste processing) _____ ?
 - ii) Adjacent Uses _____ ?
 - iii) Fuel Storage Tanks (Min. of Consumer and Commercial Relations, Fuel Safety Branch) _____ ?
 - iv) Records of old landfills or previous complaints or violations on site (MOEE district office) _____ ?
 - v) Water Well Presence-Water Quality _____
 - vi) Use of Potentially Hazardous Substances On Site (eg. pesticides, batteries, chemicals) _____ ?
 - vii) Other Findings (eg.-natural gas wells, radon gas, radioactivity) _____ ?
- d) Have other contaminant assessments taken place on this site _____ ?
- e) In your opinion, does site contain evidence of contamination?
 (A "YES" answer is warranted if there is question of the nature or extent of contamination or the use of hazardous substances.) YES _____ NO _____
- f) If YES, recommend a Phase I Environmental Site Assessment (contaminant assessment) be done in PART IV.

3) HERITAGE - In Ontario, Heritage Resources may include: (i) Buildings, Structures or Ruins, (ii) Archaeological sites, (iii) Cultural Landscapes, and (iv) Places with Sacred or Secular Value.

- a) Does any ORC inventory state that the effected property has NO heritage significance? If YES, go to 4, below. If NO, go to 3(b).
- b) Does the municipality or its Local Architectural Conservation Advisory Committee (LACAC) or other heritage interest group (eg. First Nations) consider the effected property to have heritage significance? If YES, go to 3(d). If NO, attach reply to checklist, copy ORC inventory, and go to 4. If UNKNOWN, go to 3(c).
- c) Does Min. of Culture, Tourism and Recreation (MCTR) consider the effected property to have heritage significance? If YES or UNKNOWN, go to 3(e). If NO, attach reply to checklist, copy MBS inventory and go to 4.
- d) Does municipality or LACAC consider that undertaking will affect the heritage aspect of the effected property? If YES or UNKNOWN, note same in PART IV and proceed with Heritage Significance Study. If NO, attach reply to checklist, copy ORC inventory and go to 4.
- e) Does MCTR consider that undertaking will affect the heritage aspect of the effected property? If YES or UNKNOWN, note in PART IV and proceed with Heritage Significance Study. If NO, attach reply to checklist, copy ORC inventory and go to 4.

- 4) ENVIRONMENTALLY SIGNIFICANT AREAS (ESAs) (Ref:Class EA GLOSSARY)
 - a) M.N.R. contact:
 - Wetlands? Areas of Natural and Scientific Interest? (ANSIs)
 - Habitats designated by Endangered Species Act?
 - Habitats designated or proposed of rare, threatened or endangered species?
 - b) Conservation Authority contact:
 - ESAs? Floodplains?
 - c) Municipal contact:
 - ESA designation in Official Plans?
 - Groundwater recharge sites?

- d) Niagara Escarpment Plan re: Natural or Rural Areas?
- e) Environment Canada, Environmental Assessment Co-ordination Committee: Any Federal lands?
- f) Is site part of, or adjacent to, an ESA? : YES _____ NO _____
- g) If YES, describe ESA below and on attached site plan.
Description: _____
- h) In your opinion, based on the above contacts and any current, relevant ORC feasibility studies, could the intended use and project cause any local, long term changes large enough to threaten the ESA? YES _____ NO _____
- i) If YES, hold further implementation until a Category C process is completed and note this resolution in PART IV, below.
- j) Where the site is part of an ESA, and a sale or disposal is intended, is the purchaser a non-conservation body?
YES _____ NO _____
- k) If NO, go to 5, below.
- l) If YES, EITHER ensure the purchaser becomes a conservation body, OR bump-up to a Category C process, OR modify boundaries of sale to exclude ESA with adequate setback, OR abandon sale and note resolution in PART IV, below.
- 5) **DISTINCTIVE ENVIRONMENTAL FEATURES**
- a) Does visual inspection reveal any natural features (other than ESAs noted above) such as floodplain, high groundwater level, streams, rivers, natural corridors (eg. hedgerows), woodlots, wetlands, springs, water bodies, topography, prevailing slope direction, steep slopes, ravines, rock outcrops: YES _____ NO _____
- b) If YES, describe below, and on attached site plan.
Description: _____
- c) Would any of the observed features affect the implementation of the project as currently planned? YES _____ NO _____
- d) Do Municipal Authorities or interest groups indicate that any of the observed features warrant protection?
YES _____ NO _____
- e) If YES, to either of the last two questions, describe effects and/or protection measures in PART IV.
- f) If NO, go to 6, below.
- 6) **SERVICING CAPACITY RE SEWERAGE, WATER, ROADS, GAS, HYDRO, ETC.**
- a) Does Servicing involve a Septic System? YES _____ NO _____
- b) If YES, note in PART IV and attach technical research supporting site's capacity to sustain a septic system.
- c) If well water is in use, is water undrinkable due to pollution? YES _____ NO _____ N/A _____
- d) If YES, specify source of pollution and note in "Contaminants" section above and describe resolution in PART IV, below.
- e) If NO, cite your evidence: _____
- f) Based on local municipality, MOEE or MTO or other contacts or current, relevant ORC feasibility studies, will the intended use and project require new or different servicing?
YES _____ NO _____

- g) If YES, specify your contact and anticipated resolution of new or different service in PART IV, below.

PART IV-SUMMARY OF RESOLUTION TO "YES" ANSWERS, eg. ACTION PLAN FOR IMPACTS, MITIGATION AND MONITORING (Ref.Section 6 of Class EA)

1) Land Use

2) Contaminants

3) Heritage

4) Environmentally Sensitive Areas

5) Distinctive Environmental Features

6) Servicing Capacity

i

SIGN OFF

"I hereby certify, to the best of my knowledge at this date, that the above description of the undertaking and effected site is correct, that the directly affected parties noted on this RECORD were consulted by ORC, that the issues raised by the directly affected parties with regard to the above 6 site-specific points, including any impacts, mitigation, net effects and monitoring were dealt with as per the notes and attachments to this RECORD, and finally that the results of these investigations verify the CATEGORY B status of the undertaking."

SIGNATURE OF ORC ADMINISTRATOR/PROJECT MANAGER:

DATE:

c:\wp\files\check.
AUGUST 21, 1995

ONTARIO REALTY CORPORATION CONTAMINANT CHECKLIST

To Be Used By ORC Agents as an aid to determine the potential existence or absence of contaminants while fulfilling requirements of Class EA Category "B" Projects, i.e. transactions, land use changes, construction, etc.

INSPECTION DATA

Property Address _____

City _____ Area Code _____ Legal Description _____

Property Is _____ Vacant Land _____ Improved _____

Occupied By Whom _____ Phone () _____

1. Is the property or any adjoining property used for an industrial use?

Owner: Occupants (if applicable):
Yes _____ No _____ Unknown _____ Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

2. To the best of your knowledge, has the property or any adjoining property been used for an industrial use in the past?

Owner: Occupants (if applicable):
Yes _____ No _____ Unknown _____ Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

3. Is the property or any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?

Owner: Occupants (if applicable):
Yes _____ No _____ Unknown _____ Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

4. To the best of your knowledge has the property or any adjoining property been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?

Owner: Occupants (if applicable):
Yes _____ No _____ Unknown _____ Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

LAND ISSUES

5. Are there currently, or to the best of your knowledge have there been previously, any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of greater than 5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

6. Are there currently, or to the best of your knowledge have there been previously, any industrial drums (typically 55 gal (208 L) or sacks of chemicals located on the property or at the facility?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

7. Has fill dirt been brought onto the property that originated from a contaminated site or that is of an unknown origin?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

8. Are there currently, or to the best of your knowledge have there been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

9. Is there currently, or to the best of your knowledge has there been previously, any stained soil on the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

10. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered storage tanks (above or underground) located on the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

11. Are there currently, or to the best of your knowledge have there been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

STRUCTURE ISSUES

12. Are there currently, or to the best of your knowledge have there been previously, any flooring, drains, or walls located within the facility that are stained by substances other than water or are emitting foul odours?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

13. Is there any evidence of asbestos, urea formaldehyde foam insulation, lead hazard (flaking paint), pesticides/herbicides, PCB's, radon gas on the subject property? Specify _____

OTHER ISSUES

14. If the property is served by a private well or non-public water system, have contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as contaminated by any government environmental/health agency?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

15. Does the owner or occupant of the property have any knowledge of environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

16. Has the owner or occupant of the property been informed of the past or current existence of hazardous substances or petroleum products or environmental violations with respect to the property or any facility located on the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

17. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

18. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

19. Does the property discharge waste water on or adjacent to the property other than storm water into a sanitary sewer system?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

20. To the best of your knowledge, have any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials been dumped above grade, buried and/or burned on the property?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

21. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCB's?

Owner: Yes _____ No _____ Unknown _____ Occupants (if applicable): Yes _____ No _____ Unknown _____

Observed During Site Visit:
Yes _____ No _____ Unknown _____

22. Do any government record systems list the property within the circumference of the area noted below:

| | | |
|---|-----|----|
| Fuel Storage Area | Yes | No |
| Works Department Road Maintenance Yard | Yes | No |
| List of Hazardous Waste Sites | Yes | No |
| Solid Waste/Landfill Facilities - within 0.5 mile (0.8 Km)? | Yes | No |
| Other (specify) | Yes | No |

23. Based upon a review of fire insurance maps Yes No
or consultation with the local fire department serving the property, are any buildings or other improvements on the property or on an adjoining property identified as having been used for an industrial use or uses likely to lead to contamination of the property?

24. In your opinion, does the property contain Yes No
evidence of contamination?

(A 'yes' answer is warranted if there is any question of the nature or extent of contamination, or the use of hazardous substances on or adjacent to the property is suspected, or any suspicion exists of cross boundary migration of contaminants, or housing is a potential use).

If 'yes', recommend on Class EA checklist that a Phase 1 Environmental Site Assessment be done.

ORC agent represents that to the best of the ORC agent's knowledge the above statements and facts are true and correct, and to the best of the ORC agent's actual knowledge, no material facts have been suppressed or misstated.

ORC Agent's Signature

Date

NOTES:

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